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Информация о владельце:
ФИО: Ястребов Олег Александрович
Должность: Ректор
Дата подписания: 28.05.2024 11:42:00
Уникальный программный ключ:
ca953a0120d891083f939673078ef1a989dae18a

**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

**Modern stream in oil and gas processing in Russia / Современные направления
нефтегазопереработки в России**

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

1. COURSE GOALS

The goal of the course "Modern stream in oil and gas processing in Russia / Современные направления нефтегазопереработки в России" is the study by students of chemistry, mechanism, kinetic and thermodynamic laws of the main reactions of organic synthesis, which underlie large-scale production of organic synthesis; study of technological design of the main processes of organic synthesis and areas of application of manufactured products.

The aims of the course are:

- study of processes of deep chemical processing of hydrocarbon raw materials, synthesis of surfactants and polymers;
- study of devices and equipment for the chemical processing of hydrocarbons;
- analysis of ways to improve and modernize technological production.

2. REQUIREMENTS FOR LEARNING OUTCOMES

The course " Modern stream in oil and gas processing in Russia / Современные направления нефтегазопереработки в России " 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)
SPC-5	Able to draw up technical documentation for the implementation of the technological process (work schedules, instructions, plans, estimates, requests for materials, equipment, etc.), make an economic assessment of oil and gas fields in accordance with approved forms	SPC-5.1 Knows the requirements and GOSTs for the preparation of technical documentation, basic methods of geological and industrial assessment of oil and gas fields; methods of geological-industrial and geological-economic assessment (GEO) of new geological exploration projects, taking into account all the uncertainties and risks of their implementation SPC-5.2 Can draw up and draw up technical documentation for the implementation of technological processes in the field of oil and gas field development, transportation and processing of oil and oil products; apply new methods of geological and industrial evaluation of oil and gas fields; determine the geological resources and the probability of finding a deposit, its production potential; carry out planning and evaluation of infrastructure solutions; determination of costs for the discovery and development of a field SPC-5.3 Has the methodology for preparing primary reporting, including work schedules, instructions, plans, estimates, applications for materials, equipment according to approved forms
SPC- 6	Capable of applying the basic principles of rational use of natural resources and environmental protection	SPC-6.1 Knows the legal and methodological framework of the procedure for conducting environmental impact assessment EIA and environmental expert activities for use in professional activities; fundamentals of the theory and normative legal acts of the integrated development and rational use of natural resources and environmental protection; the procedure for conducting a geological examination of projects, regulatory documents for compiling an environmental passport

Competence code	Competence descriptor	Competence formation indicators (within this course)
		<p>SPC-6.2 Can assess the state of the environment when conducting complex geological and geographical studies; use mechanisms for the rational use of natural resources and environmental protection; apply regulatory and methodological documents to assess and prevent environmental damage at production facilities</p> <p>SPC-6.3 Has the methodology of rational use of natural resources and environmental protection; a system of methods (EIA) and conducting state environmental expertise for successful research and production activities; skills and knowledge to assess environmental damage at production facilities, modern methods for eliminating the consequences and preventing environmental damage at production facilities</p>
SPC-9	Able to organize the work of performers, find and make management decisions, rules for ensuring the safety of technological processes, as well as personnel when working in the field, in laboratories, in office processing	<p>SPC-9.1 Knows the safety rules and safety precautions when working in the field, in laboratories, during office processing</p> <p>SPC-9.2 Can justify and make management decisions in the field of organization and regulation of labor; conduct briefings on ensuring the safety of technological processes, as well as personnel when working in the field, in laboratories, during office processing</p> <p>SPC-9.3 Has the methodology for ensuring the safety of technological processes, as well as personnel when working in the field, in laboratories, during office processing</p>

3. ACADEMIC PROGRAMME STRUCTURE

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

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

Competence code	Name of competence	Previous disciplines/modules, practices*	Subsequent disciplines/modules, practices*
SPC-5	Able to draw up technical documentation for the implementation of the technological process (work schedules, instructions, plans, estimates, requests for materials, equipment, etc.), make an economic assessment of oil and gas fields in accordance with approved forms		<p><i>Comprehensive analysis of processing, storage and marketing of hydrocarbons**;</i></p> <p><i>Diagnostics of oil and petroleum products main pipeline facilities**;</i></p> <p><i>Improving the efficiency of the production process and operation of equipment for the extraction of hydrocarbons**;</i></p> <p><i>Innovative technologies for the development of hydrocarbon deposits**;</i></p> <p><i>Innovative technologies for the transportation and storage of hydrocarbons**;</i></p>

Competence code	Name of competence	Previous disciplines/modules, practices*	Subsequent disciplines/modules, practices*
			Modern aspects of geological and geophysical research in the oil and gas industry; Technologies for developing prospective hydrocarbon reserves; Technological practice (educational) / Технологическая практика (учебная); Technological practice (industrial) / Технологическая практика (производственная); Pre-graduation Practical Training;
SPC- 6	Capable of applying the basic principles of rational use of natural resources and environmental protection		<i>Technological practice (industrial) / Технологическая практика (производственная);</i> <i>Pre-graduation Practical Training;</i> <i>Project management in the oil and gas industry**;</i> <i>Economics and management of oil and gas production**;</i> <i>Current development of the production of unconventional hydrocarbon resources in the world;</i> <i>Technological processes of pipeline transport;</i> <i>Technologies for developing prospective hydrocarbon reserves;</i>
SPC-9	Able to organize the work of performers, find and make management decisions, rules for ensuring the safety of technological processes, as well as personnel when working in the field, in laboratories, in office processing		<i>Technological practice (educational) / Технологическая практика (учебная);</i> <i>Current development of the production of unconventional hydrocarbon resources in the world;</i> <i>Machinery and equipment for field development and transportation of hydrocarbons;</i> <i>Methods of oil production intensification;</i> <i>Modern aspects of geological and geophysical research in the oil and gas industry;</i>

Competence code	Name of competence	Previous disciplines/modules, practices*	Subsequent disciplines/modules, practices*
			<i>Technologies for developing prospective hydrocarbon reserves; Technological practice (industrial) / Технологическая практика (производственная);</i>

* - filled in in accordance with the matrix of competencies and the Higher Education Programme

4. COURSE WORKLOAD

The total workload of the course " Modern stream in oil and gas processing in Russia / Современные направления нефтегазопереработки в России " is 5 credits.

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

Type of study work	TOTAL, acc.	Semester(s)
		1
<i>Contact academic hours, acc .</i>	54	54
including:		
Lectures	18	18
Laboratory work		
Seminars (workshops/tutorials)	36	36
<i>Self-study (ies), academic hours</i>	99	99
<i>Evaluation and assessment (exam or pass/fail grading)</i>	27	27
The course total workload	acc.hrs.	180
	credits	5

5. COURSE MODULE and CONTENTS

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

Name of the discipline section	Contents of the section (topic)	Type of academic work
Section 1. Status and development trends of the global oil and gas processing industry	Objectives and content of the course. Prospects for the production and use of commercial products of oil and gas processing	Lecture, Seminar
Section 2. Gas processing technology	Classification of types of technological fuel, physical and chemical bases for the creation of technologies for the processing of liquid hydrocarbon raw materials and gas.	Lecture, Seminar
	Methods for the preparation and purification of natural gases.	
	New directions and technologies for gas processing, commercial products from gaseous raw materials	
Section 3. Technology for preparing oil and gas condensate for processing	Methods of their preparation for processing and separation Technology of separation treatment of oil and gas	Lecture, Seminar

	condensate. Separation equipment	
Section 4. Oil and gas condensate processing technology	Atmospheric distillation of oil and gas condensates; atmospheric-vacuum distillation of oil, technological bases for the separation and purification of distillates and residues using various reagents, deasphalting, dewaxing	Lecture, Seminar
	New trends in oil, gas and gas condensate processing technology	
Section 5. Recycling of crude oil	Thermal processes of oil raw materials processing.	Lecture, Seminar
	Catalytic processes of processing of oil raw materials.	
	Hydrocatalytic processes of oil raw materials processing.	

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	Training room for conducting lecture-type classes: room. No. 335 A set of specialized furniture; technical means: projection screen; multimedia projector SANYO PROextraX; system block DEPO Neos 220	
Seminar	Classroom for conducting seminar-type classes: room. No. 356 A set of specialized furniture; chalk board; monitor NEC PLASMA MONITO MODEL PX-42XM1G; system block DEPO Neos 220	
For self-study	Classroom for conducting seminar-type classes: room. No. 356 A set of specialized furniture; chalk board; monitor NEC PLASMA MONITO MODEL PX-42XM1G; system block DEPO Neos 220	

7. RESOURCES RECOMMENDED FOR COURSE

Main reading(sources):

1. Solodova, N.L. Chemical The main directions of oil and gas processing in Russia: textbook / N.L. Solodova, D.A. Khalikov; Ministry of Education and Science of Russia, Kazan National Research Technological University. - Kazan: Kazan Research Technological University (KNITU), 2012. - 122 p. : tab., schemes. – Access mode: by subscription. <https://biblioclub.ru/index.php?page=book&id=258408>

2. Zarifyanova, M.Z. Chemistry and technology of secondary oil refining processes: textbook / M.Z. Zarifyanova, T.L. Puchkova, A.V. Sharifullin; Ministry of Education and Science of Russia, Kazan National Research Technological University. - Kazan: Kazan Research Technological University (KNRTU), 2015. - 156 p. : tab., schemes. – Access mode: by subscription. <https://biblioclub.ru/index.php?page=book&id=428799>

Additional(optional) reading (sources):

1. Ponomareva, G. A. Hydrocarbons of oil and gas: physical and chemical properties:

textbook / G. A. Ponomareva. - Orenburg: OGU, 2016. - 98 p. - ISBN 978-5-7410-1411-0. —
Text: electronic // Doe: electronic library system. <https://e.lanbook.com/book/98000>

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/>
- EL "Trinity Bridge"

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- EL "Yurayt" <http://www.biblio-online.ru>
- EL "Student Consultant" www.studentlibrary.ru
- EL "Lan" <http://e.lanbook.com/>
- EL "Trinity Bridge"

Learning toolkits for self- studies:

1. A course of lectures on the course " Modern stream in oil and gas processing in Russia / Современные направления нефтегазопереработки в России ".
2. Guidelines for students on the development of the course " Modern stream in oil and gas processing in Russia / Современные направления нефтегазопереработки в России ".

*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.

8. ASSESSMENT TOOLKIT AND GRADING SYSTEM* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL AS COURSE RESULTS

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

* The assessment toolkit and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

DEVELOPERS:

Professor of the Department of Mineral
Developing and Oil&Gas Engineering

position, educational department

Kapustin V.M.

name and surname

Senior lecturer of the Department of Mineral
Developing and Oil&Gas Engineering

position, educational department

Kapitonova I.L.

name and surname

Head of Department:

Head of the Department of Mineral Developing
and Oil&Gas Engineering

position, educational department

Kotelnikov A.E.

name and surname

Head of Educational Programme:

Professor of the Department of Mineral
Developing and Oil&Gas Engineering

position, educational department

Kapustin V.M.

name and surname