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

Approved at the meeting of the Academic Council of RUDN University
Protocol No. 12
September 24, 2018
(date, month, year)

Opened by order of the Rector of RUDN University No. 886
November 13, 2018
(date, month, year)

PROFESSIONAL EDUCATION PROGRAMME OF HIGHER EDUCATION

Field of Studies/ Speciality:
13.04.03 Energy Engineering
field of studies / speciality code and title

Profile/Specialisation:
Mechanical Engineering
higher education programme title

The Educational Programme is developed in compliance with:
Educational Standard of RUDN University, approved by Order of the Rector No. 371 dated 21.05.2021
(day, month, year)

Level of education:
master's
(bachelor's / specialist's / master's – to fill in the required)

Graduate's Qualification:
Master
(graduate's qualification in compliance with the order of the Ministry of Education and Science of Russian Federation dated September 12, 2013, No. 1061)

Length of Educational Programme:

2 years		
(full-time education)	(part-time education)	(correspondence education)

AGREED by:

Head of Educational Programme	Chairperson of Didactic Council	Head of Educational Department
Y.A. Radin	M.Yu. Malkova	Yu.N. Razoumny
(signature)	(signature)	(signature)
(day, month, year)	(day, month, year)	(day, month, year)

2024

1. EDUCATIONAL PROGRAMME GOAL (MISSION)

The program is aimed at training highly qualified specialists in the fields of science and technology related to the design, research and operation of reciprocating internal combustion engines for various purposes, their units, systems and elements.

In the course of study, students undergo theoretical and practical training in order to form general cultural, general professional and professional competencies. Students acquire the skills of scientific research, design and engineering work, which allow them to carry out professional activities in senior positions in Russian and international companies specializing in the design, operation, repair, technical and service maintenance of reciprocating internal combustion engines, as well as in research organizations.

2. EDUCATIONAL PROGRAMME RELEVANCE, SPECIFICITY, AND UNIQUENESS

Knowledge of theoretical issues in the theory of work processes, design and mathematical modeling of heat engines allows graduates to work in any region of the world. Thanks to the international composition of the training group, you compare the features of the operation of power plants in different conditions.

The peculiarity of the training is that a large number of hours are allocated for scientific research and practice. Lectures and workshops by practitioners from various organizations and graduates of the program are regularly held. The opportunity to participate in the student exchange program with partner universities.

3. . LABOUR MARKET NEEDS FOR PERSONNEL TRAINING IN EDUCATIONAL PROGRAMME PROFILE

Graduates who have mastered this program are focused on working in Russian and international companies specializing in industries related to reciprocating internal combustion engines: design, manufacturing, operating organizations, research centers, higher educational institutions, etc.

5. SPECIAL REQUIREMENTS FOR POTENTIAL APPLICANTS

The Master's program is designed for applicants who already have a higher education (bachelor's degree or specialist), have basic knowledge in the field of energy engineering and wish to expand their competencies in this field. Basic knowledge in the

field of energy engineering is tested during entrance tests in the form of an interdisciplinary exam, which is conducted in accordance with the rules of admission to the university in the direction of 13.04.03 "Energy engineering", posted on the website of the RUDN.

6. FEATURES OF EDUCATIONAL PROGRAMME IMPLEMENTATION

6.1. The Educational Programme is implemented without the use of distance learning technologies, using elements of e-learning with the help of the RUDN TUIS system.

6.2. The language of the Educational Programme implementation is *English.*

6.3. The Educational Programme is does not provide for education of people with disabilities.

6.4. The Educational Programme is implemented by the Federal State Autonomous Educational Institution of Higher Education "Peoples' Friendship University of Russia.

The information about partner organisations involved in the implementation of the Educational Programme *(educational and scientific organisations, manufacturing enterprises, etc.)* should be provided.

Name of partner organisation	**Interaction functionality** (*students' research at a partner organsation, internships, etc.)*
Joint Institute of High Temperatures of the Russian Academy of Sciences	Conducting practical training for students, internships, employment of graduates, scientific work of students on the basis of the enterprise.
Federal State Unitary Enterprise Scientific Automotive Institute	Conducting practical training for students, internships, employment of graduates, scientific work of students on the basis of the enterprise.

6.5. The information on the planned introductory/advanced field internships and (or) research & development internships

Internship*	**Internship location** *(organisation name and location)*
Practice in obtaining primary skills of research work / Практика по получение первичных навыков научно-исследовательской работы Federal State Unitary Enterprise Scientific Automotive Institute (introductory internship / orientation / intramural)	Peoples' Friendship University of Russia named after Patrice Lumumba, Moscow
Research Practice / Научно-исследовательская практика (technological / intramural)	Peoples' Friendship University of Russia named after Patrice Lumumba, Moscow; Joint Institute of High Temperatures of the Russian Academy of Sciences, Moscow; Federal State Unitary Enterprise Scientific Automotive Institute, Moscow

Internship*	**Internship location** *(organisation name and location)*
Research work / Научно-исследовательская работа (research / intramural)	Peoples' Friendship University of Russia named after Patrice Lumumba, Moscow
Undergraduate Training / Преддипломная практика (pre-graduate / intramural))	Peoples' Friendship University of Russia named after Patrice Lumumba, Moscow; Joint Institute of High Temperatures of the Russian Academy of Sciences, Moscow; Federal State Unitary Enterprise Scientific Automotive Institute, Moscow

* The section should indicate the type (introductory/advanced field internship), the kind (orientation, technological, research, pre-graduate, etc.), and the mode (intramural/ extramural) of internsh**.**

7. CHARACTERISTICS OF EDUCATIONAL PROGRAMME GRADUATE'S PROFESSIONAL ACTIVITIES

7.1. The field(s) of professional activities of the Educational Programme graduate, where he/she can carry out his/her professional activities:

01 Education and science (in the field of vocational training and vocational education, in the field of scientific research);

19 Extraction, processing, transportation of oil and gas (in the field of development and operation of energy equipment for gas transmission systems);

20 Electric power industry (in the field of energy engineering);

24 Nuclear industry (in the field of development and operation of internal combustion engines, thermal mechanical and heat exchange main and auxiliary equipment);

28 Production of machinery and equipment (in the field of energy equipment design);

40 Cross-cutting types of professional activity in industry (in the field of ensuring the safe operation of power equipment operating under excessive pressure).

Graduates can carry out professional activities in other fields of professional activity and (or) areas of professional activity, provided that their level of education and acquired competencies meet the requirements for the qualification of an employee.

7.2. The type(s) of professional activities tasks, which the graduate is trained to solve when mastering the Educational Programme:

scientific research;

Design and engineering Department.

7.3. The list of generalised labour functions and labour functions which are related to the professional activities of the Educational Programme graduate and are taken into account in the course of its development.*

Code and title of occupational standard	**Generalised labour functions**			**Labour functions**		
	Code	Title	Qualification level	Code	Title	Qualification level
40.011 Specialist in	A	Conducting research and	5	A/01.5	Carrying out work on the	5

Code and title of occupational standard	Generalised labour functions			Labour functions		
	Code	Title	Qualification level	Code	Title	Qualification level
research and development		development work on individual sections of the topic			processing and analysis of scientific and technical information and research results	
				A/02.5	Implementation of experiments and registration of research and development results	5
				A/03.5	Preparation of documentation elements, draft plans and programs for individual stages of work	5
40.011 Specialist in research and development	B	Conducting research and development work in the study of independent topics	6	B/01.6	Conducting patent research and determining the characteristics of products (services)	6
				B/02.6	Carrying out work on the processing and analysis of scientific and technical information and research results	6
				B/03.6	Leadership of a group of employees in the study of independent topics	6

* The wording of labour functions is taken from the relevant Occupational Standards.

8. REQUIREMENTS FOR EDUCATIONAL PROGRAMME OUTCOMES

8.1. Upon completion of the Educational Programme, the graduate is expected to acquire the following Generic Competences (GCs):

Code and descriptor of generic competence	Code and competence level indicator
GC-1 Ability to carry out a	GC-1.1. Analyzes the problematic situation and decomposes it into

Code and descriptor of generic competence	Code and competence level indicator
critical analysis of problematic situations based on a systematic approach, develop a strategy for action	separate tasks; GC-1.2. Develops a strategy for solving the task; GC-1.3. Forms possible solutions to problems.
GC-2 Ability to manage a project at all stages of its life cycle	GC-2.1. Formulates a project task based on the problem posed and a way to solve it through the implementation of project management; GC-2.2. Develops the concept of the project within the framework of the designated problem: formulates the purpose, objectives, justifies the relevance, significance, expected results and possible areas of their application; GC-2.3. Plans the necessary resources, including taking into account the possibility of their replacement.
GC-3 Ability to organize and manage the work of the team, developing a team strategy to achieve the set goal	GC-3.1. Demonstrates an understanding of the principles of teamwork; GC-3.2. Plans and adjusts the work of the team taking into account the interests, behaviors and opinions of its members; GC-3.3 Resolves conflicts and contradictions in business communication based on consideration of the interests of all parties.
GC-4 Ability apply modern communication technologies in the official language of the Russian Federation and a foreign language(s) for academic and professional interaction	GC-4.1. Carries out academic and professional interaction, including in a foreign language; GC-4.2. Translates academic texts (abstracts, abstracts, reviews, articles, etc.) from a foreign language or into a foreign language; GC-4.3. Uses modern information and communication tools for communication.
GC-5 Ability to analyze and take into account the diversity of cultures in the process of intercultural interaction	GC-5.1. Demonstrates an understanding of the characteristics of different cultures and nations; GC-5.2. Builds social interaction, taking into account the common and special features of different cultures and religions; GC-5.3. Ensures the creation of a non-discriminatory interaction environment when performing professional tasks.
GC-6 Ability determine and implement the priorities of his own activities and ways to improve them based on self-assessment	GC-6.1. Controls the amount of time spent on specific activities; GC-6.2. Develops tools and methods of time management in the performance of specific tasks, projects, goals; GC-6.3. Analyzes your resources and their limits (personal, situational, temporary, etc.) for the successful completion of the task.
GC-7 Ability to search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems; evaluate information, its reliability, build logical conclusions	GC-7.1. To know the methods of collecting and processing information using digital means, as well as current Russian and foreign sources of information in the field of professional activity, principles, methods and means of solving standard tasks of professional activity using digital means and taking into account the basic requirements of information security; GC-7.2. Be able to apply methods of searching, collecting and processing information; using digital means, carry out critical analysis and synthesis of information obtained from various sources, and solve standard tasks of professional activity using digital means and taking into account the basic requirements of information security; GC-7.3. Possess methods of searching, collecting and processing, critical analysis and synthesis of information using digital tools to solve tasks, skills in preparing reviews, annotations, abstracts, scientific

Code and descriptor of generic competence	Code and competence level indicator
based on incoming information and data	reports, publications and bibliographies on research work using digital tools and taking into account information security requirements.

8.2. Upon completion of the Educational Programme, the graduate is expected to acquire the following general professional competences (GPCs):

Code and descriptor of general professional competence	Code and competence level indicator
GPC-1 Ability to formulate research goals and objectives, identify priorities for solving problems, and select evaluation criteria	GPC-1.1. Formulates the goals and objectives of the study; GPC-1.2. Defines the sequence of problem solving GPC-1.3. Formulates the criteria for making a decision.
GPC-2 Ability to apply modern research methods, evaluate and present the results of the work performed	GPC-2.1. Selects the necessary research method to solve the task; GPC-2.2. Analyzes the results obtained; GPC-2.3. Represents the results of the work performed.

8.3. Upon completion of the Educational Programme, the graduate is expected to acquire the following professional competences (PCs)* ::

Code and descriptor of professional competence	Code and competence level indicator	Code and title of occupational standard for relevant PC
PC-1 Ability to analyze, make scientific generalizations and conclusions, put forward new ideas, interpret and present the results of scientific research	PC-1.1. Knowledge of modern methods of scientific research in the subject area; PC-1.2. The ability to conduct scientific research, analysis and put forward new ideas; PC-1.3. Have the skills to interpret and present the results of scientific research.	40.011 Specialist in research and development
PC -2 Ability to carry out research and development in the field of professional activity	PC-2.1. Know the basics of using information technology; PC-2.2. Conducting research on individual tasks; PC-2.3. Have the skills to generalize and evaluate the results of scientific research.	40.011 Specialist in research and development

*The Educational Programme's developer formulates the PC, taking into account the requirements of occupational standards and the Educational Programme field of study.

9. MATRIX OF COMPETENCES that students acquire when mastering the Educational Programme Mechanical Engineering, implemented under the RUDN University Academic Council decision dated "24" September 2018 (Protocol No. 12) in the field of studies / speciality 13.04.03 «Power Engineering»

Code	**Courses/modules that** form students' competences	**GENERIC COMPETENCES**						
		GC-1 Ability to carry out a critical analysis of problematic situations based on a systematic approach, develop a strategy for action	GC-2 Ability to manage a project at all stages of its life cycle	GC-3 Ability to organize and manage the work of the team, developing a team strategy to achieve the set goal	GC-4 Ability apply modern communication technologies in the official language of the Russian Federation and a foreign language(s) for academic and professional interaction	GC-5 Ability to analyze and take into account the diversity of cultures in the process of intercultural interaction	GC-6 Ability determine and implement the priorities of his own activities and ways to improve them based on self-assessment	GC-7 Ability to search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems; evaluate information, its reliability, build logical conclusions based on incoming information and data
Block 1.	**Disciplines (modules)**							
B1.O	**Mandatory part**							
B1.O.01	**Core component**							
B1.O.01.01	Professional Russian (as a foreign language) / Русский язык (как иностранный) в профессиональной деятельности				GC-4.1, GC-4.2, GC-4.3	GC-5.1, GC-5.2, GC-5.3		
B1.O.01.02	Philosophical issues of technical knowledge / Философские вопросы технических знаний	GC-1.1, GC-1.2, GC-1.3					GC-6.1, GC-6.2, GC-6.3	
B1.O.02	**Variable component**							

Code	Courses/modules that form students' competences	GENERIC COMPETENCES						
		GC-1 Ability to carry out a critical analysis of problematic situations based on a systematic approach, develop a strategy for action	GC-2 Ability to manage a project at all stages of its life cycle	GC-3 Ability to organize and manage the work of the team, developing a team strategy to achieve the set goal	GC-4 Ability apply modern communication technologies in the official language of the Russian Federation and a foreign language(s) for academic and professional interaction	GC-5 Ability to analyze and take into account the diversity of cultures in the process of intercultural interaction	GC-6 Ability determine and implement the priorities of his own activities and ways to improve them based on self-assessment	GC-7 Ability to search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems; evaluate information, its reliability, build logical conclusions based on incoming information and data
B1.O.02.01	Modern energy technology / Современные энергетические технологии			GC-3.1, GC-3.2, GC-3.3				
B1.O.02.02	Modern issues of power engineering science and manufacture / Современные проблемы науки и производства в энергетическом машиностроении			GC-3.1, GC-3.2, GC-3.3				
B1.O.02.03	Mathematical modeling of thermal processes / Математическое моделирование тепловых процессов	GC-1.1, GC-1.2, GC-1.3						
B1.O.02.04	Fueld heat engine co-generation plant / Когенерационные установки на базе тепловых двигателей		GC-2.1, GC-2.2, GC-2.3					
B1.O.02.05	Modern computer communication services / Современные компьютерные коммуникационные технологии		GC-2.1, GC-2.2, GC-2.3					GC-7.1, GC-7.2, GC-7.3

Code	Courses/modules that form students' competences	GENERIC COMPETENCES						
		GC-1 Ability to carry out a critical analysis of problematic situations based on a systematic approach, develop a strategy for action	GC-2 Ability to manage a project at all stages of its life cycle	GC-3 Ability to organize and manage the work of the team, developing a team strategy to achieve the set goal	GC-4 Ability apply modern communication technologies in the official language of the Russian Federation and a foreign language(s) for academic and professional interaction	GC-5 Ability to analyze and take into account the diversity of cultures in the process of intercultural interaction	GC-6 Ability determine and implement the priorities of his own activities and ways to improve them based on self-assessment	GC-7 Ability to search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems; evaluate information, its reliability, build logical conclusions based on incoming information and data
B1.O.02.06	Internal Combustion Engine test methods / Методы испытаний двигателей внутреннего сгорания							
B1.O.02.07	Special chapters of the theory of heat engines / Спец главы теории тепловых двигателей	GC-1.1, GC-1.2, GC-1.3						
B1.O.02.08	Reduction of internal combustion engine pollution issues / Проблемы снижения вредных выбросов ДВС							GC-7.1, GC-7.2, GC-7.3
B1.O.02.09	Automatic heat engine control / Автоматическое регулирование тепловых двигателей	GC-1.1, GC-1.2, GC-1.3						
B1.O.02.10	Patenting / Патентоведение	GC-1.1, GC-1.2, GC-1.3						
B1.O.02.11	Geoinformation Systems and Applications / Геоинформационные системы и их применение							GC-7.1, GC-7.2, GC-7.3

Code	Courses/modules that form students' competences	GENERIC COMPETENCES						
		GC-1 Ability to carry out a critical analysis of problematic situations based on a systematic approach, develop a strategy for action	GC-2 Ability to manage a project at all stages of its life cycle	GC-3 Ability to organize and manage the work of the team, developing a team strategy to achieve the set goal	GC-4 Ability apply modern communication technologies in the official language of the Russian Federation and a foreign language(s) for academic and professional interaction	GC-5 Ability to analyze and take into account the diversity of cultures in the process of intercultural interaction	GC-6 Ability determine and implement the priorities of his own activities and ways to improve them based on self-assessment	GC-7 Ability to search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems; evaluate information, its reliability, build logical conclusions based on incoming information and data
B1.O.02.12	Alternative Energy Sources / Альтернативные источники энергии	GC-1.1, GC-1.2, GC-1.3						
Часть, формируемая участниками образовательных отношений								
B1.B.01	**Variable component**							
B1.B.01.ДВ.01	**Variable discipline**							
B1.B.01.ДВ.01.01	Systems of fuel supply for ICE / Системы топливоподачи	GC-1.1, GC-1.2, GC-1.3						
B1.B.01.ДВ.01.02	Prospects for the use of alternative fuels in diesel engines / Перспективы применения альтернативных топлив в дизелях	GC-1.1, GC-1.2, GC-1.3						
B1.B.01.ДВ.02	**Variable discipline**							
B1.B.01.ДВ.02.01	Special chapters of construction theory / Специальные главы теории и		GC-2.1, GC-2.2, GC-2.3					

Code	Courses/modules that form students' competences	GENERIC COMPETENCES						
		GC-1 Ability to carry out a critical analysis of problematic situations based on a systematic approach, develop a strategy for action	GC-2 Ability to manage a project at all stages of its life cycle	GC-3 Ability to organize and manage the work of the team, developing a team strategy to achieve the set goal	GC-4 Ability apply modern communication technologies in the official language of the Russian Federation and a foreign language(s) for academic and professional interaction	GC-5 Ability to analyze and take into account the diversity of cultures in the process of intercultural interaction	GC-6 Ability determine and implement the priorities of his own activities and ways to improve them based on self-assessment	GC-7 Ability to search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems; evaluate information, its reliability, build logical conclusions based on incoming information and data
	конструирования двигателей внутреннего сгорания							
B1.B.01.ДВ.02.02	Improving of economical and ecological ICE characteristics / Повышение экономических и экологических качеств двигателей внутреннего сгорания		GC-2.1, GC-2.2, GC-2.3					
Blok 2. Practice								
Mandatory part								
B2.O.01	**Core component**							
B2.O.01.01 (У)	Practice in obtaining primary skills of research work / Практика по получение первичных навыков научно-исследовательской работы	GC-1.1, GC-1.2, GC-1.3						
B2.O.02	**Variable component**							
B2.O.02.01 (П)	Research Practice / Научно-исследовательская практика							

Code	Courses/modules that form students' competences	GENERIC COMPETENCES						
		GC-1 Ability to carry out a critical analysis of problematic situations based on a systematic approach, develop a strategy for action	GC-2 Ability to manage a project at all stages of its life cycle	GC-3 Ability to organize and manage the work of the team, developing a team strategy to achieve the set goal	GC-4 Ability apply modern communication technologies in the official language of the Russian Federation and a foreign language(s) for academic and professional interaction	GC-5 Ability to analyze and take into account the diversity of cultures in the process of intercultural interaction	GC-6 Ability determine and implement the priorities of his own activities and ways to improve them based on self-assessment	GC-7 Ability to search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems; evaluate information, its reliability, build logical conclusions based on incoming information and data
Часть, формируемая участниками образовательных отношений								
B2.B.01(H)	Research work / Научно-исследовательская работа							
B2.B.03(Пд)	Undergraduate Training / Преддипломная практика		GC-2.1, GC-2.2, GC-2.3					
B3	**Final State Examination**							
B3.01 (Г)	State Exam / Государственный экзамен	GC-1.1, GC-1.2, GC-1.3	GC-2.1, GC-2.2, GC-2.3	GC-3.1, GC-3.2, GC-3.3	GC-4.1, GC-4.2, GC-4.3	GC-5.1, GC-5.2, GC-5.3	GC-6.1, GC-6.2, GC-6.3	GC-7.1, GC-7.2, GC-7.3
B3.02 (Д)	Protection of final qualifying work / Выпускная квалификационная работа	GC-1.1, GC-1.2, GC-1.3	GC-2.1, GC-2.2, GC-2.3	GC-3.1, GC-3.2, GC-3.3	GC-4.1, GC-4.2, GC-4.3	GC-5.1, GC-5.2, GC-5.3	GC-6.1, GC-6.2, GC-6.3	GC-7.1, GC-7.2, GC-7.3

Code	Courses/modules that form students' competences	GENERAL PROFESSIONAL COMPETENCES	
		GPC-1 Ability to formulate research goals and objectives, identify priorities for solving problems, and select evaluation criteria	GPC-2 Ability to apply modern research methods, evaluate and present the results of the work performed
Block 1.	**Disciplines (modules)**		
B1.O	**Mandatory part**		
B1.O.01	**Core component**		
B1.O.01.01	Professional Russian (as a foreign language) / Русский язык (как иностранный) в профессиональной деятельности		
B1.O.01.02	Philosophical issues of technical knowledge / Философские вопросы технических знаний		
B1.O.02	**Variable component**		
B1.O.02.01	Modern energy technology / Современные энергетические технологии		GPC -2.1, GPC -2.2, GPC -2.3
B1.O.02.02	Modern issues of power engineering science and manufacture / Современные проблемы наGCи и производства в энергетическом машиностроении		GPC -2.1, GPC -2.2, GPC -2.3
B1.O.02.03	Mathematical modeling of thermal processes / Математическое моделирование тепловых процессов		GPC -2.1, GPC -2.2, GPC -2.3
B1.O.02.04	Fueld heat engine co-generation plant / Когенерационные установки на базе тепловых двигателей		GPC -2.1, GPC -2.2, GPC -2.3
B1.O.02.05	Modern computer communication services / Современные компьютерные коммуникационные технологии		GPC -2.1, GPC -2.2, GPC -2.3
B1.O.02.06	Internal Combustion Engine test methods / Методы испытаний двигателей внутреннего сгорания	GPC-1.1, GPC-1.2, GPC -1.3	
B1.O.02.07	Special chapters of the theory of heat engines / Спец главы теории тепловых двигателей	GPC-1.1, GPC-1.2, GPC -1.3	
B1.O.02.08	Reduction of internal combustion engine pollution issues / Проблемы снижения вредных выбросов ДВС		
B1.O.02.09	Automatic heat engine control / Автоматическое регулирование тепловых двигателей	GPC-1.1, GPC-1.2, GPC -1.3	
B1.O.02.10	Patenting / Патентоведение		
B1.O.02.11	Geoinformation Systems and Applications / Геоинформационные системы и их применение		

Code	Courses/modules that form students' competences	GENERAL PROFESSIONAL COMPETENCES	
		GPC-1 Ability to formulate research goals and objectives, identify priorities for solving problems, and select evaluation criteria	GPC-2 Ability to apply modern research methods, evaluate and present the results of the work performed
B1.O.02.12	Alternative Energy Sources / Альтернативные источники энергии	GPC-1.1, GPC-1.2, GPC -1.3	
Часть, формируемая участниками образовательных отношений			
B1.B.01	**Variable component**		
B1.B.01.ДВ.01	**Variable discipline**		
B1.B.01.ДВ.01.01	Systems of fuel supply for ICE / Системы топливоподачи		
B1.B.01.ДВ.01.02	Prospects for the use of alternative fuels in diesel engines / Перспективы применения альтернативных топлив в дизелях		
B1.B.01.ДВ.02	**Variable discipline**		
B1.B.01.ДВ.02.01	Special chapters of construction theory / Специальные главы теории и конструирования двигателей внутреннего сгорания		
B1.B.01.ДВ.02.02	Improving of economical and ecological ICE characteristics / Повышение экономических и экологических качеств двигателей внутреннего сгорания		
Blok 2. Practice			
Mandatory part			
B2.O.01	**Core component**		
B2.O.01.01(У)	Practice in obtaining primary skills of research work / Практика по получение первичных навыков научно-исследовательской работы		
B2.O.02	**Variable component**		
B2.O.02.01(П)	Research Practice / Научно-исследовательская практика		
Часть, формируемая участниками образовательных отношений			
B2.B.01(Н)	Research work / Научно-исследовательская работа		
B2.B.03(Пд)	Undergraduate Training / Преддипломная практика		
B3	**Final State Examination**		
B3.01 (Г)	State Exam / Государственный экзамен	GPC-1.1, GPC-1.2, GPC -1.3	GPC -2.1, GPC -2.2, GPC -2.3
B3.02 (Д)	Protection of final qualifying work / Выпускная квалификационная работа	GPC-1.1, GPC-1.2, GPC -1.3	GPC -2.1, GPC -2.2, GPC -2.3

Code	**Courses/modules that** form students' competences	**PROFESSIONAL COMPETENCES**	
		PC-1 Ability to analyze, make scientific generalizations and conclusions, put forward new ideas, interpret and present the results of scientific research	PC -2 Ability to carry out research and development in the field of professional activity
Block 1.	**Disciplines (modules)**		
B1.O	**Mandatory part**		
B1.O.01	**Core component**		
B1.O.01.01	Professional Russian (as a foreign language) / Русский язык (как иностранный) в профессиональной деятельности		
B1.O.01.02	Philosophical issues of technical knowledge / Философские вопросы технических знаний		
B1.O.02	**Variable component**		
B1.O.02.01	Modern energy technology / Современные энергетические технологии		
B1.O.02.02	Modern issues of power engineering science and manufacture / Современные проблемы наGCи и производства в энергетическом машиностроении		
B1.O.02.03	Mathematical modeling of thermal processes / Математическое моделирование тепловых процессов		
B1.O.02.04	Fueld heat engine co-generation plant / Когенерационные установки на базе тепловых двигателей		
B1.O.02.05	Modern computer communication services / Современные компьютерные коммуникационные технологии		
B1.O.02.06	Internal Combustion Engine test methods / Методы испытаний двигателей внутреннего сгорания		PC-2.1, PC-2.2, PC-2.3
B1.O.02.07	Special chapters of the theory of heat engines / Спец главы теории тепловых двигателей		
B1.O.02.08	Reduction of internal combustion engine pollution issues / Проблемы снижения вредных выбросов ДВС		
B1.O.02.09	Automatic heat engine control / Автоматическое регулирование тепловых двигателей		
B1.O.02.10	Patenting / Патентоведение	PC-1.1, PC-1.2, PC-1.3	

Code	Courses/modules that form students' competences	PROFESSIONAL COMPETENCES	
		PC-1 Ability to analyze, make scientific generalizations and conclusions, put forward new ideas, interpret and present the results of scientific research	PC -2 Ability to carry out research and development in the field of professional activity
B1.O.02.11	Geoinformation Systems and Applications / Геоинформационные системы и их применение		
B1.O.02.12	Alternative Energy Sources / Альтернативные источники энергии	PC-1.1, PC-1.2, PC-1.3	
Часть, формируемая участниками образовательных отношений			
B1.B.01	**Variable component**		
B1.B.01.ДВ.01	**Variable discipline**		
B1.B.01.ДВ.01.01	Systems of fuel supply for ICE / Системы топливоподачи	PC-1.1, PC-1.2, PC-1.3	
B1.B.01.ДВ.01.02	Prospects for the use of alternative fuels in diesel engines / Перспективы применения альтернативных топлив в дизелях	PC-1.1, PC-1.2, PC-1.3	
B1.B.01.ДВ.02	**Variable discipline**		
B1.B.01.ДВ.02.01	Special chapters of construction theory / Специальные главы теории и конструирования двигателей внутреннего сгорания		
B1.B.01.ДВ.02.02	Improving of economical and ecological ICE characteristics / Повышение экономических и экологических качеств двигателей внутреннего сгорания		
Blok 2. Practice			
Mandatory part			
B2.O.01	**Core component**		
B2.O.01.01(У)	Practice in obtaining primary skills of research work / Практика по получение первичных навыков научно-исследовательской работы	PC-1.1, PC-1.2, PC-1.3	
B2.O.02	**Variable component**		
B2.O.02.01(П)	Research Practice / Научно-исследовательская практика	PC-1.1, PC-1.2, PC-1.3	PC-2.1, PC-2.2, PC-2.3
Часть, формируемая участниками образовательных отношений			
B2.B.01(Н)	Research work / Научно-исследовательская работа	PC-1.1, PC-1.2, PC-1.3	PC-2.1, PC-2.2, PC-2.3

Code	**Courses/modules that** form students' competences	**PROFESSIONAL COMPETENCES**	
		PC-1 Ability to analyze, make scientific generalizations and conclusions, put forward new ideas, interpret and present the results of scientific research	PC -2 Ability to carry out research and development in the field of professional activity
B2.B.03(Пд)	Undergraduate Training / Преддипломная практика	PC-1.1, PC-1.2, PC-1.3	
B3	**Final State Examination**		
B3.01 (Г)	State Exam / Государственный экзамен	PC-1.1, PC-1.2, PC-1.3	PC-2.1, PC-2.2, PC-2.3
B3.02 (Д)	Protection of final qualifying work / Выпускная квалификационная работа	PC-1.1, PC-1.2, PC-1.3	PC-2.1, PC-2.2, PC-2.3