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. 888
November 13, 2018
(date, month, year)

PROFESSIONAL EDUCATION PROGRAMME OF HIGHER EDUCATION

Field of Studies/ Speciality:
08.04.01 Civil Engineering
field of studies / speciality code and title

Profile/Specialisation:
Civil Engineering and Built Environment
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
M.I. Rynkovskaya	S.B. Yazyev	Yu.N. Razoumny
(signature)	(signature)	(signature)
(day, month, year)	(day, month, year)	(day, month, year)

2026

1. EDUCATIONAL PROGRAMME GOAL (MISSION)

Master's program Civil Engineering and Built Environment is focused on training of high-class specialists in the field of construction. The educational program is designed in such a way that allows students to form both universal and professional competencies required by the educational standard and the most popular professional competencies of today's industry. In the process of education students receive theoretical training, practical skills, as well as the skills of research and scientific-pedagogical work. This allows them after graduation from the educational program to work effectively at the enterprises of the construction complex in managerial positions, as well as in research organizations.

2. EDUCATIONAL PROGRAMME RELEVANCE, SPECIFICITY, AND UNIQUENESS

The educational program is updated annually in order to take into account the needs of the construction complex in specialists with the most sought-after competencies of the industry. The program includes new disciplines in order to acquaint future professionals with new directions, innovations, promising developments, which are already being implemented, or will be in demand in the construction industry in the coming years.

In the course of this program, students have the opportunity to choose the most interesting educational trajectories and to change them if necessary. In addition to the main subjects, students have the opportunity to study elective disciplines that expand and deepen their professional competencies. In the course of training students are encouraged to do term papers, graduation works, projects on topics chosen by students. All this makes it possible to take into account the individual interests of students, increase their involvement in the educational process, and, as a result, increase the effectiveness of their training. In addition, it makes it possible to train multidisciplinary specialists with versatile professional competencies.

Interactive technologies such as business games, case studies, interdisciplinary projects, practices and internships at leading enterprises of the construction complex are actively used in the learning process.

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

The main potential employers of graduates of the educational program:

- design firms,
- construction companies,
- organizations that have subdivisions engaged in design or construction work.
- research centers dealing with the problems of the complex construction,
- higher educational institutions that train specialists in construction.

4. SPECIAL REQUIREMENTS FOR POTENTIAL APPLICANTS

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

Basic knowledge in the field of construction is tested during the entrance tests in the form of an interdisciplinary examination, which is held in accordance with the rules of admission to the University in the field of 08.04.01 "Construction", posted on the website of PFUR.

5. FEATURES OF EDUCATIONAL PROGRAMME IMPLEMENTATION

5.1. 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.

5.2. The language of the Educational Programme implementation is English.

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

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

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

Internship	Internship location
Introductory practices (introductory, intramural / extramural)	LLC "Gidrospetsproekt", Moscow; JSC "Design and Technological Bureau of Concrete and Reinforced Concrete", Moscow;

Internship	Internship location
Design Practice (advanced field internship, intramural / extramural)	JSC "SIC "Construction", Moscow; CJSC "SIC Stadium", Moscow; ZET-PROJECT LLC, Moscow; Department of Construction technology and structural materials of the PFUR Engineering Academy, as well as other organizations: –organizations (enterprises) for the construction, installation, repair and reconstruction of buildings, structures, their parts and individual structures (specialized organizations); –research, design and development institutions and firms; –companies for the production of building structures and products, the introduction of experimental materials and technologies for construction; –construction laboratories, quality and certification centers, customer and supervisory services, etc.
Technological practice (advanced field internship, intramural / extramural)	
Pedagogical practice (introductory, intramural / extramural)	
Independent Research Work (obtaining basic skills of research work) (introductory, intramural / extramural)	
Independent Research Work (advanced field internship, intramural / extramural)	
Pre-Graduation Practice (advanced field internship, intramural / extramural)	

6. CHARACTERISTICS OF EDUCATIONAL PROGRAMME GRADUATE'S PROFESSIONAL ACTIVITIES

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

10 Architecture, engineering, geodesy, topography, and design

16 Construction and housing and communal services

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

- research;
- design;
- technological;
- pedagogical;
- organizational and managerial;
- service and maintenance.

7. REQUIREMENTS FOR EDUCATIONAL PROGRAMME OUTCOMES

7.1. 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 Able to critically analyze problem situations on the basis of a systematic approach, to develop a strategy of action	GC-1.1 Analyzes the problem, identifying its basic components
	GC-1.2 Identifies and ranks the information required to solve the task
	GC-1.3 Selects ways to solve the problem, analyzes the possible consequences of their use
GC-2 Able to manage the project at all stages of its life cycle	GC-2.1 Formulates the goals and objectives of the project, determines the expected results
	GC-2.2 Within the scope of the tasks, identifies the available resources and limitations
	GC-2.3 Develops a project implementation schedule
	GC-2.4 Monitors the progress of the project, adjusts the schedule in accordance with the results of the control, evaluates the performance of the project
GC-3 Able to organize and lead a team, developing a team strategy to achieve the goal	GC-3.1 Knows how to organize teamwork, develop a strategy to achieve the goal
	GC-3.2 Able to monitor the progress of teamwork and adjust its work for the effective achievement of goals
GC-4 Able to use modern communication technologies in the state language of the Russian Federation and foreign language(s) for academic and professional interaction	GC-4.1 Carries out academic and professional interaction in Russian and foreign languages
	GC-4.2 Uses modern information and communication technologies to search for information and solve standard communication tasks in Russian and foreign languages
	GC-4.3 Able to present materials of academic and professional activities at public events
GC-5 Able to analyze and take into account the diversity of cultures in the process of intercultural interaction	GC-5.1 Shows an understanding of the characteristics of different cultures
	GC-5.2 Builds social interaction in personal and mass communication in order to fulfill professional tasks, taking into account the peculiarities of ethnic groups and faiths, philosophical and ethical teachings
GC-6 Able to identify and implement the priorities of their own activities and ways to improve them on the basis of self-assessment	GC-6.1 Analyzes tasks, projects, and their goals. Defines its resources and their limits (personal, situational, temporary, etc.) for the successful completion of the task
	GC-6.2 Prioritize and choose the appropriate tools and methods for achieving goals and managing time
GC-7 Able: to search for the neces-sary sources of information and data, perceive, analyze, remember and transmit information using digital means, as well as using algorithms when working with data received from various sources to effectively use the information to solve problems ; to assess information, its reliability, to build logical conclusions on the basis of incoming information and data	GC-7.1 Searches for relevant sources of information and data, perceives, analyzes, remembers and transmits information using digital tools and algorithms when working with data from various sources in order to effectively use the information to solve problems
	GC-7.2 Evaluates information, its reliability, builds logical conclusions on the basis of incoming information and data

7.2. 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 Able to solve problems of professional activity on the basis of theoretical and practical foundations, the mathematical apparatus of the fundamental sciences	GPC-1.1 Selects a mathematical model suitable for the professional problem to be solved, sets the required parameters and boundary conditions
	GPC-1.2 Solves mathematical modeling problems using suitable analytical, numerical, or numerical-analytical methods
	GPC-1.3 Solves professional problems using modern software systems for mathematical, digital modeling of structures
GPC-2 Able to analyze, critically comprehend and present information, search for scientific and technical information, acquire new knowledge, including with the help of information technology	GPC-2.1 Able to search for scientific and technical information, including with the help of information technology
	GPC-2.2 Able to analyze, critically comprehend information, acquire new knowledge
	GPC-2.3 Able to present found and meaningful information, including with the help of information technology
GPC-3 Able to set and solve scientific and technical problems in the field of construction, construction industry and housing and communal services on the basis of knowledge of industry problems and experience in their solution	GPC-3.1 Able to formulate and solve scientific and technical tasks in the field of building structures design
	GPC-3.2 Able to set and solve scientific and technical tasks in the field of technology, organization, management of construction and operation of capital construction projects
	GPC-3.3 Able to formulate and solve scientific and technical tasks in the field of engineering systems design
GPC-4 Able to use and develop project and administrative documentation, as well as participate in the development of normative legal acts in the field of construction and housing and communal services	GPC-4.1 Able to use and develop project documentation
	GPC-4.2 Able to use and develop administrative documentation
	GPC-4.3 Able to use normative legal acts in the field of construction industry and housing and communal services, as well as to participate in their development
GPC-5 Able to conduct and organize design and survey work in the field of construction, housing and communal services, carry out technical expertise of projects and designer's supervision of their compliance	GPC-5.1 Able to conduct and organize survey work in the field of construction and housing and communal services
	GPC-5.2 Capable of conducting and organizing technical expertise of projects and author's supervision of their observance
GPC-6 Able to carry out research of objects and processes in the field of construction and housing and	GPC-6.1 Able to formulate goals, set research objectives, develop a research program
	GPC-6.2 Able to choose appropriate research methods and carry out research according to the chosen methodology

Code and descriptor of general professional competence	Code and competence level indicator
communal services	GPC-6.3 Capable of processing, analyzing and drawing up research results
	GPC-6.4 Able to present and defend the results of the research
GPC-7 Able to manage an organization operating in the construction industry and housing and communal services, to organize and optimize its production activities	GPC-7.1 Capable of planning and organizing work in the field of design, construction, operation of capital construction projects
	GPC-7.2 Has knowledge in the field of operational management, management of works in the field of design, construction, operation of capital construction objects
	GPC-7.3 Capable of controlling and accepting work in the design, construction and operation of capital construction projects
	GPC-7.4 Knows the order of interaction with the customer, the delivery of completed work in the design, construction, operation of capital construction objects
	GPC-7.5 Able to develop measures to improve the efficiency of work in the design, construction, operation of capital construction projects

7.3. 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 Conducting scientific research in the field of construction	PC-1.1 Able to carry out planning, preparation for research	PC-1 Carrying out applied research in the field of engineering design for urban planning activities
	PC-1.2 Able to carry out, control, receive research results	
	PC-1.3 Able to analyze and process research results	
	PC-1.4 Knows how to draw up, coordinate, and present the results of completed research	
PC-2 Development of project products based on the results of engineering and technical design for urban development activities	PC-2.1 Capable of performing engineering and technical design and developing design products for building structures, grounds and foundations	PC-2 Development of design products based on the results of engineering design for urban planning activities
	PC-2.2 Able to perform engineering and technical design and develop design products for engineering systems and engineering structures	
	PC-2.3 Is able to perform organizational and technological design and develop construction organization projects and work production projects	
PC-3 Organizational, technical and technological preparation of construction production	PC-3.1 Able to carry out scheduling of construction works	PC-3 Organizational and pedagogical support of students
	PC-3.2 Knows how to choose the required material, labor resources and construction equipment for the production of works	
	PC-3.3 Knows how to choose suitable techniques, methods of work	
	PC-3.4 Able to plan control over the production of construction works, including compliance with safety during the production of works	
	PC-3.5 Able to develop organizational and technological documentation	

Code and descriptor of professional competence	Code and competence level indicator	Code and title of occupational standard for relevant PC
PC-4 Organizational and pedagogical support of students	PC-4.1 Able to carry out the development of educational and methodological documentation under the guidance of an experienced teacher	PC-4 Management of the complex of works on operation and repair of civil buildings
	PC-4.2 Able to prepare for classes with students or monitor the knowledge of students	
	PC-4.3 Able to perform teaching activities according to specialized basic educational programs or additional education programs under the guidance of an experienced teacher	
PC-5 Organization of construction works at the capital construction facility	PC-5.1 Knows how to determine the required resources to perform the work	PC-5 Organization of construction works on the object of capital construction
	PC-5.2 Able to carry out scheduling of works	
	PC-5.3 Able to identify and take into account regulatory, legislative requirements, project requirements and organizational and technological documentation for the production of construction works	
	PC-5.4 Capable of performing operational management, monitoring the progress of work	
	PC-5.5 Able to carry out technical control, supervision, acceptance of construction works	

9. MATRIX OF COMPETENCES that students acquire when mastering the Educational Programme Civil Engineering and Built Environment, in the field of studies 08.04.01 Construction

Code	Courses/modules that form students' competences	GENERIC COMPETENCES						
		GC-1 Able to critically analyze problem situations on the basis of a systematic approach, to develop a strategy of action	GC-2 Able to manage the project at all stages of its life cycle	GC-3 Able to organize and lead a team, developing a team strategy to achieve the goal	GC-4 Able to use modern communication technologies in the state language of the Russian Federation and foreign language(s) for academic and professional interaction	GC-5 Able to analyze and take into account the diversity of cultures in the process of intercultural interaction	GC-6 Able to identify and implement the priorities of their own activities and ways to improve them on the basis of self-assessment	GC-7 Able: to search for the necessary sources of information and data, perceive, analyze, remember and transmit information using digital means, as well as using algorithms when working with data received from various sources to effectively use the information to solve problems ; to assess information, its reliability, to build logical conclusions on the basis of incoming information and data
B1	**Disciplines (modules)**							
B1.O	**Obligatory part**							
B1.O.01	**Base component**	GC-1.1, GC-1.2, GC-1.3	GC-2.1	GC-3.1	GC-4.1, GC-4.2, GC-4.3	GC-5.1, GC-5.2	GC-6.1, GC-6.2	GC-7.1, GC-7.2
B1.O.01.01	Professional Russian (as a Foreign Language)				GC-4.1, GC-4.2, GC-4.3	GC-5.1, GC-5.2		
B1.O.01.02	Problem solving techniques in Civil Engineering	GC-1.1, GC-1.2, GC-1.3	GC-2.1	GC-3.1	GC-4.2, GC-4.3		GC-6.1, GC-6.2	GC-7.1, GC-7.2
B1.O.02	**Variable component**	GC-1.1, GC-1.2, GC-1.3	GC-2.1, GC-2.2, GC-2.3, GC-2.4	GC-3.1, GC-3.2			GC-6.1, GC-6.2	GC-7.1, GC-7.2
B1.O.02.01	Mathematical methods of experimental data processing	GC-1.1, GC-1.3						GC-7.1, GC-7.2
B1.O.02.02	Numerical methods for Civil Engineering	GC-1.1, GC-1.2, GC-1.3						
B1.O.02.03	Mathematical Modelling	GC-1.1, GC-1.2, GC-1.3						
B1.O.02.04	Digital technologies in construction							GC-7.1, GC-7.2
B1.O.02.05	Project management		GC-2.1, GC-2.2, GC-2.3, GC-2.4	GC-3.1, GC-3.2			GC-6.1	

Code	Courses/modules that form students' competences	GENERIC COMPETENCES						
		GC-1 Able to critically analyze problem situations on the basis of a systematic approach, to develop a strategy of action	GC-2 Able to manage the project at all stages of its life cycle	GC-3 Able to organize and lead a team, developing a team strategy to achieve the goal	GC-4 Able to use modern communication technologies in the state language of the Russian Federation and foreign language(s) for academic and professional interaction	GC-5 Able to analyze and take into account the diversity of cultures in the process of intercultural interaction	GC-6 Able to identify and implement the priorities of their own activities and ways to improve them on the basis of self-assessment	GC-7 Able: to search for the necessary sources of information and data, perceive, analyze, remember and transmit information using digital means, as well as using algorithms when working with data received from various sources to effectively use the information to solve problems ; to assess information, its reliability, to build logical conclusions on the basis of incoming information and data
B1.O.02.06	Geoinformation Systems and Applications	GC-1.1, GC-1.2, GC-1.3						GC-7.1, GC-7.2
B1.O.02.07	Life Cycle Economics of Buildings		GC-2.1, GC-2.2, GC-2.4				GC-6.1, GC-6.2	GC-7.1, GC-7.2
B1.O.02.08	BIM-Technology in Construction Management		GC-2.1					GC-7.1, GC-7.2
B1.V	**Part formed by participants in educational relations**							
B1.V.EC.01	**Elective Module**							
B1.V.EC.01.01	Structural Design in Steel							
B1.V.EC.01.02	Nanotechnology in Civil Engineering							
B1.V.EC.02	**Elective Module**							
B1.V.EC.02.01	Structural Design in Reinforced Concrete							
B1.V.EC.02.02	Building materials: Special Topics							
B1.V.EC.03	**Elective Module**							
B1.V.EC.03.01	Structural Design in Reinforced Concrete: Special Topics							
B1.V.EC.03.02	Structural Dynamics							
B1.V.EC.04	**Elective Module**							
B1.V.EC.04.01	Structural Design in Steel: Special Topics							

Code	Courses/modules that form students' competences	GENERIC COMPETENCES						
		GC-1 Able to critically analyze problem situations on the basis of a systematic approach, to develop a strategy of action	GC-2 Able to manage the project at all stages of its life cycle	GC-3 Able to organize and lead a team, developing a team strategy to achieve the goal	GC-4 Able to use modern communication technologies in the state language of the Russian Federation and foreign language(s) for academic and professional interaction	GC-5 Able to analyze and take into account the diversity of cultures in the process of intercultural interaction	GC-6 Able to identify and implement the priorities of their own activities and ways to improve them on the basis of self-assessment	GC-7 Able: to search for the necessary sources of information and data, perceive, analyze, remember and transmit information using digital means, as well as using algorithms when working with data received from various sources to effectively use the information to solve problems ; to assess information, its reliability, to build logical conclusions on the basis of incoming information and data
B1.V.EC.04.02	Modelling of Construction Processes							
B1.V.EC.05	**Elective Module**							
B1.V.EC.05.01	Applications of Finite Element Method for Civil Engineering problems							
B1.V.EC.05.02	Sustainability in Civil Engineering							
B1.V.EC.06	**Elective Module**							
B1.V.EC.06.01	Optimization Methods in Civil Engineering							
B1.V.EC.06.02	Structural Stability							
B1.V.EC.06.03	VR and AR Technologies in Civil Engineering: Special Topics							
B1.V.EC.07	**Elective Module**							
B1.V.EC.07.01	Geometric Shaping and Analysis of Shells							
B1.V.EC.07.02	Engineering Systems of Buildings							
	Practice	GC-1.1, GC-1.2, GC-1.3	GC-2.1, GC-2.2, GC-2.3, GC-2.4	GC-3.1, GC-3.2	GC-4.1, GC-4.2, GC-4.3	GC-5.1, GC-5.2	GC-6.1, GC-6.2	GC-7.1, GC-7.2
B2.O	**Obligatory part**	GC-1.1, GC-1.2, GC-1.3	GC-2.1, GC-2.2, GC-2.3, GC-2.4	GC-3.1, GC-3.2	GC-4.1, GC-4.2, GC-4.3	GC-5.1, GC-5.2	GC-6.1, GC-6.2	GC-7.1, GC-7.2
B2.O.01	**Base component**	GC-1.1, GC-1.2, GC-1.3	GC-2.1, GC-2.2,	GC-3.1, GC-3.2	GC-4.1, GC-4.2, GC-4.3	GC-5.1, GC-5.2	GC-6.1, GC-6.2	GC-7.1, GC-7.2

Code	Courses/modules that form students' competences	GENERIC COMPETENCES						
		GC-1 Able to critically analyze problem situations on the basis of a systematic approach, to develop a strategy of action	GC-2 Able to manage the project at all stages of its life cycle	GC-3 Able to organize and lead a team, developing a team strategy to achieve the goal	GC-4 Able to use modern communication technologies in the state language of the Russian Federation and foreign language(s) for academic and professional interaction	GC-5 Able to analyze and take into account the diversity of cultures in the process of intercultural interaction	GC-6 Able to identify and implement the priorities of their own activities and ways to improve them on the basis of self-assessment	GC-7 Able: to search for the necessary sources of information and data, perceive, analyze, remember and transmit information using digital means, as well as using algorithms when working with data received from various sources to effectively use the information to solve problems ; to assess information, its reliability, to build logical conclusions on the basis of incoming information and data
			GC-2.3, GC-2.4					
B2.O.01.01(I)	Independent Research Work (obtaining basic skills of research work)	GC-1.1, GC-1.2, GC-1.3	GC-2.1, GC-2.2, GC-2.3, GC-2.4	GC-3.1, GC-3.2	GC-4.3		GC-6.1, GC-6.2	GC-7.1, GC-7.2
B2.O.01.02(I)	Pedagogical Practice			GC-3.1, GC-3.2	GC-4.1, GC-4.2, GC-4.3	GC-5.1, GC-5.2		
B2.O.01.03(I)	Introductory Practice	GC-1.1, GC-1.2, GC-1.3					GC-6.1, GC-6.2	GC-7.1, GC-7.2
B2.O.02	**Variable component**	GC-1.1, GC-1.2, GC-1.3	GC-2.1, GC-2.2, GC-2.3, GC-2.4	GC-3.1, GC-3.2	GC-4.3		GC-6.1, GC-6.2	GC-7.1, GC-7.2
B2.O.02.01(AFI)	Design Practice	GC-1.1, GC-1.2, GC-1.3						
B2.O.02.02(AFI)	Technological Practice	GC-1.1, GC-1.2, GC-1.3						
B2.O.02.03(H)	Independent Research Work	GC-1.1, GC-1.2, GC-1.3	GC-2.1, GC-2.2, GC-2.3, GC-2.4	GC-3.1, GC-3.2	GC-4.3		GC-6.1, GC-6.2	GC-7.1, GC-7.2
B2.V	**Part formed by participants in educational relations**							
B2.V.01(PG)	Pre-Graduation Practice							

Code	Courses/modules that form students' competences	GENERAL PROFESSIONAL COMPETENCES						
		GPC-1 Able to solve problems of professional activity on the basis of theoretical and practical foundations, the mathematical apparatus of the fundamental sciences	GPC-2 Able to analyze, critically comprehend and present information, search for scientific and technical information, acquire new knowledge, including with the help of information technology	GPC-3 Able to set and solve scientific and technical problems in the field of construction, construction industry and housing and communal services on the basis of knowledge of industry problems and experience in their solution	GPC-4 Able to use and develop project and administrative documentation, as well as participate in the development of normative legal acts in the field of construction and housing and communal services	GPC-5 Able to conduct and organize design and survey work in the field of construction, housing and communal services, carry out technical expertise of projects and designer's supervision of their compliance	GPC-6 Able to carry out research of objects and processes in the field of construction and housing and communal services	GPC-7 Able to manage an organization operating in the construction industry and housing and communal services, to organize and optimize its production activities
B1	**Disciplines (modules)**							
B1.O	**Obligatory part**							
B1.O.01	**Base component**		GPC-2.1, GPC-2.2, GPC-2.3				GPC-6.1, GPC-6.2, GPC-6.3, GPC-6.4	GPC-7.5
B1.O.01.01	Professional Russian (as a Foreign Language)							
B1.O.01.02	Problem solving techniques in Civil Engineering		GPC-2.1, GPC-2.2, GPC-2.3				GPC-6.1, GPC-6.2, GPC-6.3, GPC-6.4	GPC-7.5
B1.O.02	**Variable component**	GPC-1.1, GPC-1.2, GPC-1.3	GPC-2.2, GPC-2.3	GPC-3.1, GPC-3.2, GPC-3.3	GPC-4.1, GPC-4.2, GPC-4.3	GPC-5.1, GPC-5.2	GPC-6.2, GPC-6.3	GPC-7.1, GPC-7.2, GPC-7.3, GPC-7.4, GPC-7.5
B1.O.02.01	Mathematical methods of experimental data processing	GPC-1.1, GPC-1.2	GPC-2.2, GPC-2.3				GPC-6.2, GPC-6.3	
B1.O.02.02	Numerical methods for Civil Engineering	GPC-1.1, GPC-1.2, GPC-1.3					GPC-6.2, GPC-6.3	
B1.O.02.03	Mathematical Modelling	GPC-1.1, GPC-1.2, GPC-1.3		GPC-3.1			GPC-6.2, GPC-6.3	
B1.O.02.04	Digital technologies in construction	GPC-1.3		GPC-3.1, GPC-3.3	GPC-4.1, GPC-4.3	GPC-5.1, GPC-5.2		
B1.O.02.05	Project management			GPC-3.2	GPC-4.2, GPC-4.3	GPC-5.1, GPC-5.2		GPC-7.1, GPC-7.2, GPC-7.3, GPC-7.4, GPC-7.5
B1.O.02.06	Geoinformation Systems and Applications						GPC-6.2, GPC-6.3	
B1.O.02.07	Life Cycle Economics of Buildings				GPC-4.1, GPC-4.2, GPC-4.3	GPC-5.1, GPC-5.2		

Code	Courses/modules that form students' competences	GENERAL PROFESSIONAL COMPETENCES						
		GPC-1 Able to solve problems of professional activity on the basis of theoretical and practical foundations, the mathematical apparatus of the fundamental sciences	GPC-2 Able to analyze, critically comprehend and present information, search for scientific and technical information, acquire new knowledge, including with the help of information technology	GPC-3 Able to set and solve scientific and technical problems in the field of construction, construction industry and housing and communal services on the basis of knowledge of industry problems and experience in their solution	GPC-4 Able to use and develop project and administrative documentation, as well as participate in the development of normative legal acts in the field of construction and housing and communal services	GPC-5 Able to conduct and organize design and survey work in the field of construction, housing and communal services, carry out technical expertise of projects and designer's supervision of their compliance	GPC-6 Able to carry out research of objects and processes in the field of construction and housing and communal services	GPC-7 Able to manage an organization operating in the construction industry and housing and communal services, to organize and optimize its production activities
B1.O.02.08	BIM-Technology in Construction Management			GPC-3.2	GPC-4.1, GPC-4.2, GPC-4.3	GPC-5.1, GPC-5.2		GPC-7.1, GPC-7.2, GPC-7.3, GPC-7.5
B1.V	**Part formed by participants in educational relations**							
B1.V.EC.01	**Elective Module**							
B1.V.EC.01.01	Structural Design in Steel							
B1.V.EC.01.02	Nanotechnology in Civil Engineering							
B1.V.EC.02	**Elective Module**							
B1.V.EC.02.01	Structural Design in Reinforced Concrete							
B1.V.EC.02.02	Building materials: Special Topics							
B1.V.EC.03	**Elective Module**							
B1.V.EC.03.01	Structural Design in Reinforced Concrete: Special Topics							
B1.V.EC.03.02	Structural Dynamics							
B1.V.EC.04	**Elective Module**							
B1.V.EC.04.01	Structural Design in Steel: Special Topics							
B1.V.EC.04.02	Modelling of Construction Processes							
B1.V.EC.05	**Elective Module**							
B1.V.EC.05.01	Applications of Finite Element Method for Civil Engineering problems							

Code	Courses/modules that form students' competences	GENERAL PROFESSIONAL COMPETENCES						
		GPC-1 Able to solve problems of professional activity on the basis of theoretical and practical foundations, the mathematical apparatus of the fundamental sciences	GPC-2 Able to analyze, critically comprehend and present information, search for scientific and technical information, acquire new knowledge, including with the help of information technology	GPC-3 Able to set and solve scientific and technical problems in the field of construction, construction industry and housing and communal services on the basis of knowledge of industry problems and experience in their solution	GPC-4 Able to use and develop project and administrative documentation, as well as participate in the development of normative legal acts in the field of construction and housing and communal services	GPC-5 Able to conduct and organize design and survey work in the field of construction, housing and communal services, carry out technical expertise of projects and designer's supervision of their compliance	GPC-6 Able to carry out research of objects and processes in the field of construction and housing and communal services	GPC-7 Able to manage an organization operating in the construction industry and housing and communal services, to organize and optimize its production activities
B1.V.EC.05.02	Sustainability in Civil Engineering							
B1.V.EC.06	**Elective Module**							
B1.V.EC.06.01	Optimization Methods in Civil Engineering							
B1.V.EC.06.02	Structural Stability							
B1.V.EC.06.03	VR and AR Technologies in Civil Engineering: Special Topics							
B1.V.EC.07	**Elective Module**							
B1.V.EC.07.01	Geometric Shaping and Analysis of Shells							
B1.V.EC.07.02	Engineering Systems of Buildings							
	Practice	GPC-1.1, GPC-1.2, GPC-1.3	GPC-2.1, GPC-2.2, GPC-2.3	GPC-3.1, GPC-3.2, GPC-3.3	GPC-4.1, GPC-4.2, GPC-4.3	GPC-5.1, GPC-5.2	GPC-6.1, GPC-6.2, GPC-6.3, GPC-6.4	GPC-7.1, GPC-7.2, GPC-7.3, GPC-7.4, GPC-7.5
B2.O	**Obligatory part**	GPC-1.1, GPC-1.2, GPC-1.3	GPC-2.1, GPC-2.2, GPC-2.3	GPC-3.1, GPC-3.2, GPC-3.3	GPC-4.1, GPC-4.2, GPC-4.3	GPC-5.1, GPC-5.2	GPC-6.1, GPC-6.2, GPC-6.3, GPC-6.4	GPC-7.1, GPC-7.2, GPC-7.3, GPC-7.4, GPC-7.5
B2.O.01	**Base component**	GPC-1.1, GPC-1.2, GPC-1.3	GPC-2.1, GPC-2.2, GPC-2.3	GPC-3.1, GPC-3.2, GPC-3.3			GPC-6.1, GPC-6.2, GPC-6.3, GPC-6.4	
B2.O.01.01(I)	Independent Research Work (obtaining basic skills of research work)	GPC-1.1, GPC-1.2, GPC-1.3	GPC-2.1, GPC-2.2, GPC-2.3	GPC-3.1, GPC-3.2, GPC-3.3			GPC-6.1, GPC-6.2, GPC-6.3, GPC-6.4	
B2.O.01.02(I)	Pedagogical Practice							

Code	Courses/modules that form students' competences	GENERAL PROFESSIONAL COMPETENCES						
		GPC-1 Able to solve problems of professional activity on the basis of theoretical and practical foundations, the mathematical apparatus of the fundamental sciences	GPC-2 Able to analyze, critically comprehend and present information, search for scientific and technical information, acquire new knowledge, including with the help of information technology	GPC-3 Able to set and solve scientific and technical problems in the field of construction, construction industry and housing and communal services on the basis of knowledge of industry problems and experience in their solution	GPC-4 Able to use and develop project and administrative documentation, as well as participate in the development of normative legal acts in the field of construction and housing and communal services	GPC-5 Able to conduct and organize design and survey work in the field of construction, housing and communal services, carry out technical expertise of projects and designer's supervision of their compliance	GPC-6 Able to carry out research of objects and processes in the field of construction and housing and communal services	GPC-7 Able to manage an organization operating in the construction industry and housing and communal services, to organize and optimize its production activities
B2.O.01.03(I)	Introductory Practice		GPC-2.1, GPC-2.2, GPC-2.3					
B2.O.02	**Variable component**	GPC-1.1, GPC-1.2, GPC-1.3	GPC-2.1, GPC-2.2, GPC-2.3	GPC-3.1, GPC-3.2, GPC-3.3	GPC-4.1, GPC-4.2, GPC-4.3	GPC-5.1, GPC-5.2	GPC-6.1, GPC-6.2, GPC-6.3, GPC-6.4	GPC-7.1, GPC-7.2, GPC-7.3, GPC-7.4, GPC-7.5
B2.O.02.01(AFI)	Design Practice	GPC-1.3		GPC-3.1, GPC-3.3	GPC-4.1, GPC-4.2, GPC-4.3	GPC-5.1, GPC-5.2		GPC-7.1, GPC-7.2, GPC-7.3, GPC-7.4, GPC-7.5
B2.O.02.02(AFI)	Technological Practice			GPC-3.2	GPC-4.3	GPC-5.2		GPC-7.3, GPC-7.4, GPC-7.5
B2.O.02.03(H)	Independent Research Work	GPC-1.1, GPC-1.2, GPC-1.3	GPC-2.1, GPC-2.2, GPC-2.3	GPC-3.1, GPC-3.2, GPC-3.3			GPC-6.1, GPC-6.2, GPC-6.3, GPC-6.4	
B2.V	**Part formed by participants in educational relations**							
B2.V.01(PG)	Pre-Graduation Practice							

Code	**Courses/modules that** form students' competences	**PROFESSIONAL COMPETENCES**				
		PC-1 Conducting scientific research in the field of construction	PC-2 Development of project products based on the results of engineering and technical design for urban development activities	PC-3 Organizational, technical and technological preparation of construction production	PC-4 Organizational and pedagogical support of students	PC-5 Organization of construction works at the capital construction facility
B1	**Disciplines (modules)**					
B1.O	**Obligatory part**					
B1.O.01	**Base component**	PC-1.1, PC-1.2, PC-1.3, PC-1.4			PC-4.1, PC-4.2, PC-4.3	
B1.O.01.01	Professional Russian (as a Foreign Language)					
B1.O.01.02	Problem solving techniques in Civil Engineering	PC-1.1, PC-1.2, PC-1.3, PC-1.4			PC-4.1, PC-4.2, PC-4.3	
B1.O.02	**Variable component**	PC-1.3	PC-2.1, PC-2.2, PC-2.3	PC-3.1, PC-3.2, PC-3.3, PC-3.4, PC-3.5		PC-5.1, PC-5.2, PC-5.3, PC-5.4, PC-5.5
B1.O.02.01	Mathematical methods of experimental data processing	PC-1.3				
B1.O.02.02	Numerical methods for Civil Engineering					
B1.O.02.03	Mathematical Modelling					
B1.O.02.04	Digital technologies in construction		PC-2.1, PC-2.2			
B1.O.02.05	Project management					
B1.O.02.06	Geoinformation Systems and Applications					
B1.O.02.07	Life Cycle Economics of Buildings		PC-2.3	PC-3.2, PC-3.3		PC-5.1
B1.O.02.08	BIM-Technology in Construction Management			PC-3.1, PC-3.2, PC-3.3, PC-3.4, PC-3.5		PC-5.1, PC-5.2, PC-5.3, PC-5.4, PC-5.5
B1.V	**Part formed by participants in educational relations**	PC-1.1, PC-1.2, PC-1.3, PC-1.4	PC-2.1, PC-2.2, PC-2.3	PC-3.1, PC-3.2, PC-3.3, PC-3.4, PC-3.5		PC-5.1, PC-5.2, PC-5.3, PC-5.4, PC-5.5
B1.V.EC.01	**Elective Module**		PC-2.1			

Code	Courses/modules that form students' competences	PROFESSIONAL COMPETENCES				
		PC-1 Conducting scientific research in the field of construction	PC-2 Development of project products based on the results of engineering and technical design for urban development activities	PC-3 Organizational, technical and technological preparation of construction production	PC-4 Organizational and pedagogical support of students	PC-5 Organization of construction works at the capital construction facility
B1.V.EC.01.01	Structural Design in Steel		PC-2.1			
B1.V.EC.01.02	Nanotechnology in Civil Engineering	PC-1.1, PC-1.2, PC-1.3, PC-1.4	PC-2.1			
B1.V.EC.02	**Elective Module**	PC-1.2, PC-1.3	PC-2.1, PC-2.2			
B1.V.EC.02.01	Structural Design in Reinforced Concrete		PC-2.1			
B1.V.EC.02.02	Building materials: Special Topics	PC-1.2, PC-1.3	PC-2.1, PC-2.2			
B1.V.EC.03	**Elective Module**		PC-2.1			
B1.V.EC.03.01	Structural Design in Reinforced Concrete: Special Topics		PC-2.1			
B1.V.EC.03.02	Structural Dynamics		PC-2.1, PC-2.2			
B1.V.EC.04	**Elective Module**		PC-2.3	PC-3.1, PC-3.2, PC-3.3, PC-3.4, PC-3.5		PC-5.1, PC-5.2, PC-5.3, PC-5.4, PC-5.5
B1.V.EC.04.01	Structural Design in Steel: Special Topics		PC-2.1			
B1.V.EC.04.02	Modelling of Construction Processes		PC-2.3	PC-3.1, PC-3.2, PC-3.3, PC-3.4, PC-3.5		PC-5.1, PC-5.2, PC-5.3, PC-5.4, PC-5.5
B1.V.EC.05	**Elective Module**		PC-2.1, PC-2.2			
B1.V.EC.05.01	Applications of Finite Element Method for Civil Engineering problems		PC-2.1, PC-2.2			
B1.V.EC.05.02	Sustainability in Civil Engineering	PC-1.1, PC-1.2, PC-1.3, PC-1.4	PC-2.1, PC-2.2, PC-2.3			
B1.V.EC.06	**Elective Module**		PC-2.1, PC-2.2			

Code	**Courses/modules that** form students' competences	**PROFESSIONAL COMPETENCES**				
		PC-1 Conducting scientific research in the field of construction	PC-2 Development of project products based on the results of engineering and technical design for urban development activities	PC-3 Organizational, technical and technological preparation of construction production	PC-4 Organizational and pedagogical support of students	PC-5 Organization of construction works at the capital construction facility
B1.V.EC.06.01	Optimization Methods in Civil Engineering		PC-2.1, PC-2.2			
B1.V.EC.06.02	Structural Stability		PC-2.1			
B1.V.EC.06.03	VR and AR Technologies in Civil Engineering: Special Topics					
B1.V.EC.07	**Elective Module**	PC-1.1, PC-1.2, PC-1.3, PC-1.4	PC-2.1			
B1.V.EC.07.01	Geometric Shaping and Analysis of Shells	PC-1.1, PC-1.2, PC-1.3, PC-1.4	PC-2.1			
B1.V.EC.07.02	Engineering Systems of Buildings		PC-2.2			
	Practice	PC-1.1, PC-1.2, PC-1.3, PC-1.4	PC-2.1, PC-2.2, PC-2.3	PC-3.1, PC-3.2, PC-3.3, PC-3.4, PC-3.5	PC-4.1, PC-4.2, PC-4.3	PC-5.1, PC-5.2, PC-5.3, PC-5.4, PC-5.5
B2.O	**Obligatory part**	PC-1.1, PC-1.2, PC-1.3, PC-1.4	PC-2.1, PC-2.2, PC-2.3	PC-3.1, PC-3.2, PC-3.3, PC-3.4, PC-3.5	PC-4.1, PC-4.2, PC-4.3	PC-5.1, PC-5.2, PC-5.3, PC-5.4, PC-5.5
B2.O.01	**Base component**	PC-1.1, PC-1.2, PC-1.3, PC-1.4			PC-4.1, PC-4.2, PC-4.3	
B2.O.01.01(I)	Independent Research Work (obtaining basic skills of research work)	PC-1.1, PC-1.2, PC-1.3, PC-1.4				
B2.O.01.02(I)	Pedagogical Practice				PC-4.1, PC-4.2, PC-4.3	
B2.O.01.03(I)	Introductory Practice					
B2.O.02	**Variable component**	PC-1.1, PC-1.2, PC-1.3, PC-1.4	PC-2.1, PC-2.2, PC-2.3	PC-3.1, PC-3.2, PC-3.3, PC-3.4, PC-3.5		PC-5.1, PC-5.2, PC-5.3, PC-5.4, PC-5.5
B2.O.02.01(AFI)	Design Practice		PC-2.1, PC-2.2			
B2.O.02.02(AFI)	Technological Practice		PC-2.3	PC-3.1, PC-3.2, PC-3.3, PC-3.4, PC-3.5		PC-5.1, PC-5.2, PC-5.3, PC-5.4, PC-5.5

Code	Courses/modules that form students' competences	PROFESSIONAL COMPETENCES				
		PC-1 Conducting scientific research in the field of construction	PC-2 Development of project products based on the results of engineering and technical design for urban development activities	PC-3 Organizational, technical and technological preparation of construction production	PC-4 Organizational and pedagogical support of students	PC-5 Organization of construction works at the capital construction facility
B2.O.02.03(H)	Independent Research Work	PC-1.1, PC-1.2, PC-1.3, PC-1.4				
B2.V	**Part formed by participants in educational relations**	PC-1.1, PC-1.2, PC-1.3, PC-1.4	PC-2.1, PC-2.2, PC-2.3	PC-3.1, PC-3.2, PC-3.3, PC-3.4, PC-3.5		PC-5.1, PC-5.2, PC-5.3, PC-5.4, PC-5.5
B2.V.01(PG)	Pre-Graduation Practice	PC-1.1, PC-1.2, PC-1.3, PC-1.4	PC-2.1, PC-2.2, PC-2.3	PC-3.1, PC-3.2, PC-3.3, PC-3.4, PC-3.5		PC-5.1, PC-5.2, PC-5.3, PC-5.4, PC-5.5