

## Profile of the Educational Program

<b>General information</b>	
<b>The official name of the education program</b>	Civil Engineering
<b>Specialty</b>	192 Building and Civil Engineering
<b>Field of study</b>	19 Architecture and Construction
<b>Higher education degree and title in the original language</b>	Bachelor, Bachelor's Degree of Building and Civil Engineering
<b>Type of diploma and scope of education program</b>	Bachelor's Degree, unitary, 240 ECTS credits, term of study 3 years 10 months
<b>Accreditation availability</b>	Ministry of Education and Science of Ukraine Accreditation Certificate Series No. 21008299 The certificate is valid until July 1, 2028.
<b>Cycle / level</b>	The first (bachelor) level NQF of Ukraine - level 7 FQ-EHEA - the first cycle EQF-LLL - Level 6
<b>Entry level education requirements</b>	Full general secondary education; general rules for entry requirements
<b>Language(s) of instruction</b>	Ukrainian
<b>Duration of the education program</b>	10 years
<b>Education program objective</b>	
	Formation of general and professional competences necessary for solving problems in field of civil engineering, systems of heat and gas supply, ventilation and conditioning, water supply and sewerage
<b>Education program specifications</b>	
<b>Subject area</b>	<p><b>Objects of learning:</b> the processes of design, construction, operation, storage and reconstruction of construction sites, engineering systems and technological processes.</p> <p><b>Learning goals:</b> training of specialists for the design and construction of buildings, engineering structures and systems, construction of structures, operation and reconstruction of construction sites.</p> <p>The theoretical content of the subject area: theoretical foundations of building technologies, theories, principles, concepts and methods of fundamental and general engineering sciences.</p> <p>Methods, techniques and technologies: methods of physical and mathematical modeling, design methods, technologies of construction of construction objects and engineering systems, technologies of manufacturing structures and materials.</p> <p>Tools and equipment: construction machines, appliances and equipment, geodetic instruments, air-conditioning equipment, control and measuring devices, necessary for the functioning of engineering systems, technological equipment for the manufacture of structures and products, tools for technological, information, instrumental, metrological, diagnostic and organizational support of construction .</p>
<b>Education program orientation</b>	Educational and professional program
<b>The main focus of the</b>	Civil engineering facilities, heat and gas supply systems, ventilation and

<b>education program and specialization</b>	air-conditioning, water supply and sewerage, installation technology, reconstruction of engineering systems for buildings and structures Key words: civil engineering, design, construction, building structures, operation, heat and gas supply, ventilation, air conditioning, water supply, sewerage
<b>Features of the program</b>	Educational program provides theoretical knowledge and practical skills in solving problems of design and operation of modern systems of heat and gas supply, ventilation and conditioning, water supply and sewerage
<b>Graduate employability and further academic studies</b>	
<b>Employability</b>	Occupations, professional job titles (Occupational Classifier DK 003: 2010). 3112 - Construction technician: – Structure Warden – Estimator – Architectural Design Technician – Technician of sanitary engineering systems – Construction technician – Construction technician (road construction) – Water Engineer – Technician-designer (construction) – Caregiver – Laboratory technician (construction) – Designer technician – Heating engineer (construction) – Technologist (manufacture of building products and structures) 3118 - Draughtsman – Technician Designer – Draughtsman Designer 3119 - Other technical specialists in the field of physical sciences and engineering – Instructor for operational, production, technical and organizational issues – Technician for organizing labor – Technician from preparation of production – Technician from preparation technical documentation – Technician from planning 3151 - Construction and fire inspectors – Inspector for the control of the technical maintenance of buildings
<b>Further academic studies</b>	Opportunity to follow the curriculum of the second (Master's degree) level of higher education. Acquiring additional qualifications in the system of postgraduate education.
<b>Instruction and Assessment</b>	
<b>Teaching and learning</b>	Student-centered learning, problem and differentiated learning technology, technology of intensification and individualization of learning, information technology, technology of developmental learning, credit transfer system of learning organization, e-learning in the Moodle system, self-study, research-based learning. Teaching is conducted in the form of: lectures, multimedia lectures, interactive lectures, practical classes, laboratory work, self-study on the basis of textbooks and notes, consultations with teachers, preparation of bachelor's qualification work.
<b>Assessment</b>	Cumulative rating system, which provides for student evaluation for all types of classroom and extracurricular learning activities, aimed at mastering the educational load from the educational program.

	<p>Oral and written surveys, including exams; test tasks, including computer-based testing on Moodle; laboratory reports; presentations; protection of course papers and projects, practice reports; protection of bachelor's qualification work.</p>
<b>Program learning outcomes</b>	
<p><b>Program learning outcomes as defined by the higher education institution</b></p>	<p>PR01. To be able to apply the basic theories, methods and principles of mathematical and natural sciences in the field of professional activity.</p> <p>PR02. To be able to apply basic professional and scientific knowledge in the field of humanities and economic sciences in cognitive and professional activity.</p> <p>PR03. To demonstrate oral and written communication skills in national and foreign languages, using interpersonal skills, working in an international context with professionals and non-professionals in the industry, using modern means of communication.</p> <p>PR04. To be able to master working skills effectively work independently (coursework and diploma design) or in a group (laboratory work, including leadership skills in their performance), the ability to get the desired result in a limited time with an emphasis on professional honesty and eliminating the possibility of plagiarism.</p> <p>PR05. To speak proficiency in national and foreign languages using professional terminology.</p> <p>PR06. To demonstrate the ability to work with geodetic tools and use topographic materials to design and build construction and engineering networks.</p> <p>PR07. To be able to use and develop technical documentation, including the use of modern information technology.</p> <p>PR08. To demonstrate the ability to effectively apply modern building materials, products and structures based on knowledge of their technical characteristics and manufacturing technology.</p> <p>PR09. To create or apply space-planning solutions for further design, including using information technology.</p> <p>PR10. To be able to assess the impact of climatic, engineering, geological and environmental features of the construction site on the design and construction of construction sites.</p> <p>PR11. To be able to determine and evaluate the load and stress-strain state of soil foundations and load-bearing structures of buildings (structures), including using modern information technologies.</p> <p>PR12. To develop constructive decisions of the object of construction on the basis of knowledge of nomenclature and design forms, ability to calculate and construct the building structures and knots of their connection.</p> <p>PR13. To develop and evaluate engineering solutions for engineering networks.</p> <p>PR14. To adhere to the modern requirements of the normative documentation in the field of construction.</p> <p>PR15. To perform and analyze economic cost calculations for construction sites.</p> <p>PR16. To design technological processes of erection and equipping of buildings (structures) and installation of engineering systems and networks.</p> <p>PR17. To be able to organize and manage construction processes in the construction of construction sites and their operation, repair and reconstruction, taking into account safety requirements.</p> <p>PR18. To demonstrate an understanding of urban design principles and infrastructure and urban facilities.</p>

	<p>PR19. To ensure reliable and safe operation of structural structures of buildings, structures and utilities.</p>
<p><b>Program learning outcomes as defined by the higher education institution</b></p>	<p>PR101. To demonstrate knowledge and understanding of the basics of heat transfer, hydro-gas and aerodynamics that occur in technological processes of heat-supply, ventilation and air-conditioning systems (HGSV&amp;C).</p> <p>PR102. To demonstrate knowledge and understanding of mathematics sections related to the basic level of processes of HGSV&amp;C systems: differential and integral calculus, algebra, functional analysis, statistics, etc.</p> <p>PR103. The knowledge of the basic normative and technical documents concerning the design, construction and operation, reconstruction, major repairs and thermal modernization of engineering systems, engineering networks of settlements; as well as national action plans, programs, etc. regarding housing and communal services reform, energy efficiency, use of renewable and non-traditional energy sources, organization of an efficient energy metering system, etc.</p> <p>PR104. To demonstrate knowledge and skills regarding baseline data collection, design, construction and operation of utility networks of settlements, systems of buildings and structures of various purposes in the part of HGS&amp;V, improvement of their energy efficiency and reduction of negative impact on the environment; to be able to make decisions technically and economically.</p> <p>PR105. To be able to make decisions on the choice of rational in terms of costs of fuel and energy resources and environmental protection of engineering systems to provide the microclimate of buildings and structures, engineering networks of settlements.</p> <p>PR106. To have basic knowledge and understanding of special sections for student's choice (gas supply, heat supply, microclimate formation system) for the purpose of future specialization and development of interdisciplinary approaches.</p> <p>PR107. To perform computer calculations of individual elements, HGSV&amp;C systems and engineering networks, and be able to analyze the results obtained.</p> <p>PR108. To be able to create an effective communication strategy to convey ideas, problems, solutions and own experience in the field of heat and gas supply, ventilation and air conditioning, energy saving, energy metering and more.</p> <p>PR201. To demonstrate knowledge and ability to apply the provisions of hydrostatics, hydrodynamics, mass transfer, thermal and thermodynamic processes to calculate the basic parameters of elements of water supply and drainage systems of settlements.</p> <p>PR202. To demonstrate knowledge of physicochemical and biological-bacteriological characteristics of natural and waste waters, theoretical bases of water systems treatment and ability to apply them in the development of technological schemes of water preparation for the needs of drinking water supply and sewage treatment of water supply and sewage systems of settlements.</p> <p>PR203. To demonstrate the ability to design as a whole and develop constructive solutions for individual elements of water supply and sewerage systems, taking into account the regulations in force in Ukraine.</p> <p>PR204. Knowledge of the nomenclature, structures, principles of operation and rules of maintenance of the basic types of equipment of water and sewerage facilities; Ability to select, calculate and organize its setup and control operation.</p>

	<p>PR205. To carry out technical and economic evaluation of the existing ones, to make an estimate of construction and operation of the designed structures of water supply and drainage systems of settlements, to determine the cost of water supply to consumers and wastewater disposal of the settlement.</p> <p>PR206. To be able to take into account the impact on the ecological status of water bodies of technical decisions made in the design, construction, adjustment and operation of elements of the water supply and drainage facilities of the settlement.</p> <p>PR207. To be able to draw up plans for current and major repairs of structures of water supply and drainage systems of settlements, washing of networks and measures for ensuring their implementation.</p>
<b>Resources for program implementation</b>	
<b>Staffing</b>	<p>Graduate Department of Gas and Heating Systems Operation: 25 scientific and pedagogical staff, 3 of them (12%) doct. tech. sciences, professors, 13 (52%) PhD.</p> <p>Teachers who work in conjunction with: Naftogaz group, V. N. Karazin Kharkiv National University, NTU "KhPI"</p> <p>Graduation Department of Water supply, sewage and water treatment: 15 scientific-pedagogical staff, 2 of them (13%) doct. tech. sciences, professors, 12 (80%) PhD.</p> <p>Teachers working in conjunction with SE «UkrRTC «Energostal», UC "Kharkivvodokanal". Specialists involved in the cooperation are PRODEKO-ELK LLP (Republic of Poland), Ecopolymer Group.</p> <p>The vast majority of scientific and teaching staff involved in the implementation of the educational program have a scientific degree and / or academic title and are full-time employees of O.M. Beketov NUUE.</p> <p>All scientific-pedagogical staff have a confirmed level of scientific and professional activity. In order to improve the professional level, all members of the scientific and pedagogical staff have to take internships including foreign once every five years.</p>
<b>Logistics</b>	<p>Laboratories equipped with multimedia installations, models, laboratory equipment for carrying out laboratory work:</p> <ul style="list-style-type: none"> <li>– Laboratory of "Gas, thermal systems and air conditioning" (97,75 m<sup>2</sup>): operating laboratory stand of technological lines of gas distribution point; operating laboratory booth with electric boiler, multimedia projector Toshiba TDPS8;</li> <li>– Laboratory for Oil and Natural Gas Transportation (67.75 m<sup>2</sup>): operating stand of gas distribution station; mock-up stand "Gas-dynamic installation of periodic cleaning of the internal cavity of the main oil and gas pipelines without reducing the gas pressure in them"; mock-up stand for the repair of gas pipelines under pressure "Mobile installation of fire-free connection of gas pipelines-branches into existing main oil and gas pipelines without reducing gas pressure in them"; display «Panasonic - 50»;</li> <li>– Laboratory "Heating and engineering equipment" (32,6 m<sup>2</sup>): operating stand "Electric boiler with automation unit" with controller of weather-dependent regulation and unit of measurement of outside temperature.</li> <li>– Laboratory "Technologies for water purification" (128 m<sup>2</sup>): installation for determining the ionic composition of water, laboratory of the SSAA (surface-active agents), tetrameters installation, pH meter, chromatograph, turbidity meter, oxygen meter, refract meter; Panasonic multimedia projector;</li> <li>– Laboratory "Water supply and sewage " (78,8 m<sup>2</sup>): filters of various designs with natural and artificial loads, reactants activators, magnetic</li> </ul>

	<p>devices, vortex apparatus, bactericidal installation for water disinfection;</p> <p>– - Laboratory of Engineering Hydraulics and Pumps (82,5 m<sup>2</sup>): laboratory stands "Parallel operation of surface electric pumps"; "Consistent operation of surface electric pumps"; "Operation of a surface electric pump in cavitation mode", "Determination of coefficients of hydraulic friction during movement in a pressure pipeline and determination of coefficients of local resistance", "Construction of a piezometric and pressure line for pressure movement of a fluid in a pipe of variable intersection, cross section" and leakage resistance through the hole and nozzles at constant pressure”, layout of the main sewage pumping station.</p>
<b>Information and training support</b>	<ul style="list-style-type: none"> <li>- official site of O.M. Beketov NUUE: <a href="http://kname.edu.ua/">http://kname.edu.ua/</a>;</li> <li>- wireless internet access points;</li> <li>- unlimited access to the Internet;</li> <li>- scientific library, reading rooms;</li> <li>- M Moodle virtual learning environment;</li> <li>- MS Office 365 suite;</li> <li>- corporate mail;</li> <li>- training and work plans;</li> <li>- schedules of the educational process;</li> <li>- educational-methodical complexes of disciplines;</li> <li>- educational and work programs of disciplines;</li> <li>- informational materials for independent and individual work of students in disciplines;</li> <li>- practice programs;</li> <li>- methodological instructions for the implementation of course projects (works), qualification work;</li> <li>- evaluation criteria for training level;</li> <li>- packages of complex control works</li> </ul>
<b>Academic mobility</b>	
<b>National Credit Mobility</b>	In accordance with the Regulations on Academic Mobility of Students, Graduate Students, Doctoral Students, Research Teachers and Researchers of O.M.Beketov NUUE
<b>International credit mobility</b>	The program develops prospects for participation and internships in research projects and academic mobility programs abroad.
<b>Training of foreign higher education applicants</b>	In accordance with the Admission Regulations to O.M.Beketov NUUE