

Profile of a Bachelor's educational program in a specialty 122 Computer Science

General information	
The full name of the higher education institution	O. M. Beketov National University of Urban Economy in Kharkiv
Degree of higher education and qualification name in the original language	Bachelor, Bachelor of Computer Science
Official name of the educational program	Computer Science
Type of diploma and volume of study program	Bachelor's degree, single, 240 ECTS credits, duration of training 3 years 10 months
Accreditation	Accreditation certificate of the Ministry of Education and Science of Ukraine № 21008297; The certificate is valid until July 1, 2023.
Cycle / level	The first (bachelor) level NQF of Ukraine – 7 level FQ-EHEA – first cycle EQF-LLL – 6 level
Prerequisites	Full secondary education General rules for entry prerequisites
Teaching language	Ukrainian
Duration of the educational program	5 years
Internet address for the permanent placement of the educational program description	https://pmit.kname.edu.ua/
Purpose of educational program	
Training of specialists capable to conduct the theoretical and experimental research in the field of computer science; to apply mathematical methods and algorithmic principles in the modeling, design, development and maintenance of information technology; to carry out the development, implementation and maintenance of intelligent systems for analysis and data processing of organizational, technical, natural and socio-economic systems.	
Characteristics of educational program	
Subject area	<p><i>Objects of study and / or activity:</i></p> <ul style="list-style-type: none"> - mathematical, informational, simulation models of real phenomena, objects, systems and processes, subject areas, data and knowledge representation - methods and technologies for obtaining, storing, processing, transmitting and using information, data mining and decision making - theory, analysis, development, efficiency evaluation, algorithm implementation, high performance computing, including parallel calculations and big data.

	<p><i>Learning objectives:</i> Training of specialists capable to conduct the theoretical and experimental research in the field of computer science; to apply mathematical methods and algorithmic principles in the modeling, design, development and maintenance of information technology; to carry out the development, implementation and maintenance of intelligent systems for analysis and data processing of organizational, technical, natural and socio-economic systems.</p> <p><i>Theoretical content of the subject area:</i> modern models, methods, algorithms, technologies, processes and ways for obtaining, presenting, processing, analyzing, transmitting, storing data in information systems.</p> <p><i>Methods, techniques and technologies:</i> mathematical models, methods and algorithms for solving theoretical and applied problems that arise in IT development; modern technologies and programming platforms; methods for collecting, analyzing and consolidating distributed information; technologies and methods of design, development and quality assurance of IT components; methods of computer graphics and data visualization technology; knowledge engineering technologies, CASE technologies for IT modeling and design;</p> <p><i>Tools and equipment:</i> distributed computing systems; computer networks; mobile and cloud technologies, database management systems, operating systems</p>
Educational program orientation	Educational and professional
Main focus of the educational program and specialization	<p>Special education in the field of information technology, specialty computer science.</p> <p><i>Keywords:</i> mathematical, information, simulation models of objects, systems and processes, methods and technologies of data acquisition, storage, processing, transmission and use, data mining and decision making, theory, analysis, development, efficiency estimation, implementation of algorithms, parallel calculations and big data.</p>
Program features	None
Suitability of graduates for employment and further learning	
Suitability for employment	<p>Professional activity as a specialist in the development of mathematical, information and software information systems, in the field of information technology, as well as the administrator of databases and systems.</p> <p>Graduates can work in professions according to the National Classification of Professions DK 003:2010:</p> <ul style="list-style-type: none"> Computing System Developers Computer Systems Engineer Computer Software Engineer Computer programmers Technical experts in the field of computer engineering IT Specialist Info communications specialist

Further learning	Opportunity to study in the program of the second (master's) level of higher education. Acquiring additional qualifications in the system of postgraduate education.
Teaching and Assessment	
Teaching and learning	Student-centered learning, self-study, learning through practice. Teaching and training includes lectures and practical classes, self-study, individual consultations with teachers, practice and implementation of the qualification work of a bachelor - a complex design project.
Assessment	Oral and written interviews, test assignments, graphic work, course projects, practice reports, oral and written exams, grading test, bachelor's qualification work defense.
Program learning outcomes	
Program learning outcomes defined by the higher education specialty standard	<p>PO 1. Apply knowledge of the basic forms and laws of abstract logical thinking, the foundations of the methodology of scientific knowledge, forms and methods of extracting, analyzing, processing and synthesizing information in the subject area of computer science.</p> <p>PO 2. Use modern mathematical apparatus of continuous and discrete analysis, linear algebra, and analytical geometry in professional activity for solving problems of theoretical and applied character in the process of designing and realization of informatization objects.</p> <p>PO 3. Use knowledge of regularities of random phenomena, their properties and operations over them, models of random processes and modern software environments for solving problems of statistical data processing and construction of predictive models.</p> <p>PO 4. Use the methods of computational intelligence, machine learning, neural network and fuzzy data processing, genetic and evolutionary programming to solve problems of recognition, prediction, classification, identification of control objects, etc.</p> <p>PO 5. Design, develop and analyze algorithms for solving computational and logical problems, evaluate the efficiency and complexity of algorithms based on the use of formal models of algorithms and computational functions.</p> <p>PO 6. Use methods of numerical differentiation and integration of functions, solving of ordinary differential and integral equations, features of numerical methods and possibilities of their adaptation to engineering problems, to have skills of software implementation of numerical methods.</p> <p>PO 7. Understand the principles of modeling of organizational and technical systems and operations; use methods of operations research, solving single- and multi-criteria optimization problems of linear, integer, nonlinear, stochastic programming.</p> <p>PO 8. Apply systematic analysis of objects, processes and systems for the tasks of analysis, forecasting, management and design of dynamic processes in macroeconomic, technical, technological and financial objects.</p> <p>PO 9. Develop software models of subject environments, choose a programming paradigm from the standpoint of convenience and quality of application for the implementation of methods and algorithms for solving problems in the field of computer science.</p>

	<p>PO 10. Use development tools for client-server applications, design conceptual, logical and physical database models, develop and optimize queries for them, create distributed databases, data stores and marts, knowledge bases, including on cloud services, using web languages programming.</p> <p>PO 11. Have the skills of managing the life cycle of software, products and services of information technologies according to the requirements and restrictions of the customer, be able to develop project documentation (feasibility study, technical assignment, business plan, agreement, contract, contract).</p> <p>PO 12. Apply methods and algorithms of computational intelligence and data mining in the tasks of classification, forecasting, cluster analysis, finding associative rules using multidimensional data analysis software support tools based on DataMining, TextMining, WebMining technologies.</p> <p>PO 13. Be proficient in system programming languages and methods for developing programs that interact with components of computer systems, know network technologies, computer network architectures, have practical skills in computer network administration technology and their software.</p> <p>PO 14. Apply knowledge of methodology and CASE-tools for designing complex systems, methods of structural analysis of systems, object-oriented design methodology in the development and study of functional models of organizational-economic and production-technical systems.</p> <p>PO 15. Understand the concept of information security, the principles of safe software design, ensure the security of computer networks in the conditions of incompleteness and uncertainty of the source data.</p> <p>PO 16. Perform parallel and distributed computing, apply numerical methods and algorithms for parallel structures, parallel programming languages in the development and operation of parallel and distributed software.</p>
<p>Program Learning Outcomes, defined by a higher education institution</p>	<p>PO 17. Communicate effectively in a foreign language in a business environment.</p> <p>PO 18. Know physics, electrical engineering, electronics and circuitry, microprocessor technology at the level necessary to solve typical problems and problems of automation.</p> <p>PO 19. Be able to take into account the social, environmental, ethical, economic aspects, requirements of occupational safety, industrial sanitation and fire safety when making technical decisions. Be able to use different types and forms of motor activity for active rest and leading a healthy lifestyle.</p> <p>PO 20. Apply language, speech, lingua-socio-cultural and communication skills for effective communication in a foreign language.</p> <p>PO 21. Use normative and legal acts regulating professional activity.</p> <p>PO 22. Analyze the role and importance of the modern city in the context of global and local challenges.</p> <p>PO 23. Apply the basic principles of political science when solving professional problems.</p>

	<p>PO 24. Justify moral principles of social and professional relations on the basis of categorical analysis of ethical theories; form a conscious sense of responsibility and moral self-improvement; make compromise decisions when performing joint activities through ethical reflection; analyze artistic sources in the context of contemporary ethical theories; determine the artistic features of the cultural development of European civilization; ability to express and substantiate their position on issues of value to the artistic heritage of humanity.</p> <p>PO 25. Analyze the processes of legal and market regulation of socio-economic labor relations.</p> <p>PO 26. Use the basic principles and rules of logical thinking in scientific knowledge and professional activity.</p> <p>PO 27. Analyze the peculiarities of cultural processes in the modern world; to make comparative characteristics of the main cultural centers of the modern world; analyze the patterns of cultural development of mankind; draw historical parallels between the contemporary cultural situation and the historical past.</p> <p>PO 28. Professional communication: create communication products, analyze communication activities; adequately respond to criticism, generate and argue new ideas; exercise communicative influence on people by encouraging them to act; express their own thoughts; identify, apply information and communication technologies; develop interpersonal skills in the team.</p> <p>PO 29. Be able to develop front-end and back-end applications using XML, JavaScript and DOM technologies.</p>
Resource support for the implementation of the program	
Staffing	<p>The qualitative level of professional training of bachelors is ensured by the qualified scientific and pedagogical staff of the department, which includes doctors and candidates of sciences, professors, associate professors. Two teachers hold a B-2 level English language certificate. All faculty members have strong practical experience in the field of information technology.</p>
Material and technical support	<p>The educational process is fully provided by the auditorium, administrative and auxiliary facilities. Specialized computer laboratories of the department have modern equipment and software (ESET antivirus software, Microsoft Office Professional, Microsoft Visual-studio-2010-express, Oracle package, Professional Project Management, FireFox, FireBug, Google Chrome, Opera, Internet Explorer, Geany, NetBeans, GIMP, Apache, PHP), the ability to access the Internet.</p> <p>For lectures, an audience with multimedia equipment (classroom 226 of the Central Building) is used. For the practical training 4 specialized laboratories are used: "Computer and Microprocessor Systems and Devices Laboratory", audience 218a of the Central Building, "Information Systems Modeling Laboratory", audience 218b of the Central Building, "Corporate Network Technology Laboratory", audience 218c of the Central Building, "Laboratory of things ", audience 225 of the Central Building.</p>
Information and educational-	<p>All educational components of the educational program "Computer Science" are provided with the following educational and methodological materials: textbooks; tutorials; lecture notes;</p>

methodological support	<p>methodical instructions and recommendations; individual tasks; collections of situational tasks (cases); Examples of solving typical tasks or completing typical tasks computer presentations; illustrative materials; resource directories and more.</p> <p>All teaching materials are available to students in the reading rooms of the Scientific Library http://library.kname.edu.ua/index.php/uk/, including in the Information Room equipped with computers with Internet access and the University's local network, in the digital repository http://eprints.kname.edu.ua, on the portal of the Distance Learning Center http://cdo.kname.edu.ua/</p>
Academic mobility	
National Credit Mobility	In accordance with the Regulations on Academic Mobility of Students, Graduate Students, Doctoral Students, Scientific-Pedagogical and Scientific Workers of O. M. Beketov NUUE.
International credit mobility	<p>O. M. Beketov NUUE has 5 existing agreements under Erasmus + International Credit Mobility with the following foreign universities, namely:</p> <ol style="list-style-type: none"> 1) Middle East Technical University, Ankara, Turkey (METU) 2) Aristotle University, Thessaloniki, Greece 3) University of Nova Gorica, Nova Gorica, Slovenia 4) Estonian University of Natural Sciences, Tartu, Estonia 5) Lodz Technical University (Lodz, Poland)
Education of foreign applicants	According to the Rules of admission to study at O. M. Beketov NUUE.