МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
ХАРКІВСЬКИЙ НАЦІОНАЛЬНИЙ ЕКОНОМІЧНИЙ УНІВЕРСИТЕТ
ІМЕНІ СЕМЕНА КУЗНЕЦЯ

УХВАЛЕНО
Рішенням вченої ради
Харківського національного
економічного університету
імені Семена Кузнеця
від 23.05.2023 р. протокол № 6

ВВЕДЕНО В ДІЮ
Наказом ректора Харківського
національного економічного університету
імені Семена Кузнеця
від 23.05.2023 р. № 144

Володимир ПОНОМАРЕНКО

ОСВІТНЬО-ПРОФЕСІЙНА ПРОГРАМА
«КОМП'ЮТЕРНІ НАУКИ»

РІВЕНЬ ВИЩОЇ ОСВІТИ	**Другий (магістерський)**
СТУПІНЬ ВИЩОЇ ОСВІТИ	**Магістр**
ГАЛУЗЬ ЗНАНЬ	**12 Інформаційні технології**
СПЕЦІАЛЬНІСТЬ	**122 Комп'ютерні науки**

Харків, 2023

THE PREAMBLE

The working group of the educational and professional program "Computer Sciences":

Serhii Volodymyrovych Minukhin, doctor of technical sciences, professor, professor of the department of information systems - guarantor of the educational program;

Zadachyn Viktor Mykhailovych, associate professor of the department of information systems, candidate of physical and mathematical sciences, associate professor;

Parfyonov Yury Eduardovych, associate professor of the department of information systems, candidate of technical sciences, associate professor;

Lina Serhiivna Shumylo, higher education student;

Hrynyov Denys Valeriyovych, head of the EPAM UNIVERSITY PROGRAM in Ukraine.

Considered on meetings department informative systems, protocol No. 7 of February 19, 2023

Reviewed by the Academic Council of the Faculty of Information Technologies, protocol No. 5 dated February 28, 2023.

The educational and professional program has been updated on the basis of:

1. Legislative and regulatory acts: Laws of Ukraine "On Education",

"About higher education", of the National Classifier of Ukraine: Classifier of Professions (DK003:2010).

2. Standard of higher education of Ukraine of the second (master's) levelfields of knowledge 12 Information technologies, specialty 122 Computer sciences. approved and put into effect by the order of the Ministry of Education and Science of Ukraine dated April 28, 2022 No. 393.

3. Analysis of the labor market, taking into account the regional context.

4. Domestic and foreign experience.

5. Employers' proposals.

6. Meeting of the working group of the OP "Computer Sciences".

7. Recommendations after the external procedure examinations

OP by the National Agency for Quality Assurance of Higher Education (the decision on the accreditation of the educational program was adopted at the meeting ON 01.28.2020, protocol No. 2 (19).2.99.

Reviews of external stakeholders (attached).

I. GENERAL CHARACTERISTICS

Level of higher education	Second (master's) level
Degree of higher education	Master's degree
Fields of knowledge	12 Information technologies
Specialties	122 Computer science
Educational program	Computer sciences / Computer sciences
Forms of acquisition of education, the amount of the educational program in credits ECTS and deadlines teaching	Full-time (full-time) form – 90 credits, 1 year 4 months; correspondence form - 90 credits, 1 year and 4 months.
Availability accreditation	National Agency for Quality Assurance of Higher Education, Decision No. 2(19).2.99 dated January 28, 2020. Certificate of accreditation of the educational program No. 157 dated January 28, 2020; The validity period of accreditation is until January 21, 2025.
Language(s) of instruction / assessment	Ukrainian, English
Structural unit responsible for OP	Department of Information Systems
Requirements to enrollment	To successfully master the master's educational program, the applicant must have a higher education of the first (bachelor's) level or second (master's) level or the educational and qualificationlevel of a specialist and the ability to master knowledge, skills and abilities in the field of journalism with a specialty in media communications. The rules and terms of admission are posted on the website of the Khneu University named after S. Kuznets via the linkhttps://www.hneu.edu.ua/normatyvni-documents/
Restrictions on forms of education	there is no
Educational qualification	master of computer science
Qualification(s) professional	Absent
Qualification in diploma	Degree of higher education - master's degreeSpecialty - 122 Computer science Educational program - Computer science
Educational purpose programs	To ensure that students of higher education acquire knowledge, skills and practical skills in the field of computer science. Formation and development of general and professional competencies of specialists who possess fundamental knowledge and practical skills in the field of computer sciences, promotion of social stability and mobility in the labor market of graduates who are able to solve complex specialized practical tasks in the field of computer sciences.

Educational focus programs	Emphasis is placed on the formation and development of professional competencies in the field of computer science: the study of theoretical and methodological provisions, organizational and practical tools, the development of computer systems for various purposes, in particular, in high-performance computing, including cloud technologies; testing methods and evaluation of the quality of software systems; application of integrated environments for the development of computer information systems, modeling and optimization of objects, systems and processes; organization of effective work on IT projects. ***Keywords***: computer science, programming, testing, quality, integrated environments, modeling, high-performance computing, cloud technologies, IT projects.
Description of the subject region	**Object(s) of study and/or activity:**collection processes, presentation, processing, storage, transmission and accessto information in computer systems. **Learning goals:**acquiring the ability to solve problems of a research and/or innovative nature in the field of computer science. **Theoretical content of the subject area:**modern models, methods, algorithms, technologies, processes and methods of obtaining, presenting, processing, analyzing, transmitting, storingdata in information and computer systems. **Methods, techniques, technologies:**methods and algorithms solving theoretical and applied problems of computer science; mathematical and computer modeling, modern programming technologies; methods of collection, analysis and consolidation of distributed information; technologies and methods of design, development and quality assurance of information technology components, computer graphics methods and data visualization technologies; knowledge engineering technologies, CASE modeling and IT design technologies. **Tools and equipment:**distributed computing systems; computer networks; mobile and cloud technologies, database management systems, operating systems, means of developing information systems and technologies.
Academic mobility	-
Academic rights	Obtaining an education according to the educational program of the third(educational and scientific) level of higher education and obtaining additional qualifications in the adult education system
Employment graduates	A Master of Computer Science is able to perform professional activities as a professional in the development of mathematical, information and software of computer systems in the field of information technologies, as well as anadministrator of databases and systems according to the National Classifier of Ukraine: Classifier of Professions (DK 003:2010) namely: 213 Computing Professionals (Computerization): 2131 Computer Systems Professionals, 2131.2 Computer Systems Developers, 2131.2 Database Administrator, 2131.2 Data Administrator, 2131.2 Access Administrator, 2131.2 Access Administrator (Group), 2131.2 Task Administrator, 2131.2 System Administrator, 2131.2Computer Systems Analyst, 2131.2 Computer Communications Analyst, 2131.2 Computer Data Bank Analyst, 2131.2 Computer software engineer, 2139.2 Computer application engineer.

II - LIST OF COMPETENCES OF THE GRADUATE

Integral competence	Ability to solve tasks research and/or of an innovative nature in the field of computer sciences.
General competence	ZK01. Ability to abstract thinking, analysis and synthesis. ZK02. Ability to apply knowledge in practical situations. ZK03. Ability to communicate in the national language both orally and in writing. ZK04. Ability to communicate in a foreign language. ZK05. Ability to learn and master modern knowledge. ZK06. The ability to be critical and self-critical. ZK07. Ability to generate new ideas (creativity). ZK08. Ability to work in a team.
Special (professional, substantive) competence	SK01. Awareness of the theoretical foundations of computer science. SK02. The ability to formalize the subject area of a certain project in the form of an appropriate information model. SK03. Ability to use mathematical methods to analyze formalized models of the subject area. SK04. The ability to collect and analyze data (including large data) to ensure the quality of project decision-making. SK05. Ability to develop, describe, analyze and optimize architectural solutions of information and computer systemsfor various purposes. SK06. Ability to apply existing and develop new algorithms for solving problems in the field of computer science. SK07. Ability to develop software according to formulated requirements, taking into account available resources and constraints. SK08. The ability to develop and implement software creation projects, including in unpredictable conditions, with unclear requirements and the need to apply new strategic approaches, use software tools to organize teamwork on the project. SK09. Ability to develop and administer databases and knowledge bases. SK10. The ability to evaluate and ensure the quality of IT projects, information and computer systems of various purposes, to apply international standards for assessing the quality of software of information and computer systems, models for assessing the maturity of information and computer systems development processes. SK11. The ability to initiate, plan and implement the development processes of information and computer systems and software, including its development, analysis, testing, system integration, implementation and support. SK12. Ability to apply existing and develop new algorithms for solving problems in the field of computer science: algorithms for solving computational and logical problems; parallel and distributed computing algorithms; algorithms for analytical processing and intellectual analysis of data (including large ones) with an assessment of their effectiveness and complexity. SK13. Ability to test software of computer information systems, perform modular, system and integration testing of applications and databases (including big data) with evaluation of test results. SK14. The ability to quantitatively and qualitatively assess the levelof management and the quality of planning, execution and implementation of IT projects using defined metrics and characteristics of efficiency and productivity.

In order to ensure the correlation of the defined competencies with the classification of competences of the NRC, the correspondence matrix of the determined competencies and descriptors of the NRC is used, which is an informational appendix (**Table 1 of the explanatory note**).

III – NORMATIVE CONTENT OF THE TRAINING OF HIGHER GRADUATE GRADUATE EDUCATION FORMULATED IN TERMS OF RESULTS TEACHING

PH1. Have specialized conceptual knowledge that includes modern scientific achievements in the field of computer science and is the basis for original thinking and conducting research, critical understanding of problems in the field of computer science and at the border of fields of knowledge.

PH2. Have specialized computer science problem-solving skills necessary for conducting research and/or carrying out innovative activities in order to develop new knowledge and procedures.

PH3. It is clear and unambiguous to convey one's own knowledge, conclusions and arguments in the field of computer science to specialists and non-specialists, in particular to people who are studying.

PH4. Manage work processes in the field of information technologies, which are complex, unpredictable and require new strategic approaches.

PH5. Evaluate the results of the teams and collectives in the field of information technologies (and/or computer systems), ensure the effectiveness of their activities.

PH6. Elaborate computer system conceptual model informative/

PH7. Develop and apply mathematical methods for the analysis of information models.

PH8. Develop mathematical models and data analysis methods (including large ones).

PH9. Develop algorithmic and software for data analysis (including large data).

PH10. Design architectural decision informative and computer systems of various purposes

PH11. Create new algorithms for solving problems in the field of computer science, evaluate their effectiveness and limitations on their application.

PH12. Design and maintain databases and knowledge (including distributed databases and data warehouses).

PH13. Assess and ensure the quality of information and computer systems for various purposes.

PH14. Test the software.

PH15. Identify the needs of potential customers regarding the automation of information processing.

PH16. Conduct research in the field of computer science.

PH17. Identify and eliminate problematic situations during software operation, formulate tasks for its modification or reengineering.

PH18. Collect, formalize, systematize, and analyze the needs and requirements for the information or computer system being developed, operated or supported.

PH19. To analyze the current state and global trends in the development of computer sciences and information technologies.

PH 20. To ensure the required level of management and quality of IT projects of enterprises.

PH21. Develop algorithms and software applications for the implementation of distributed and parallel computing, intelligent data analysis and their analytical processing.

IV. STRUCTURE OF THE EDUCATIONAL AND PROFESSIONAL PROGRAM MASTER'S TRAINING

4.1 PROGRAM STRUCTURE AND EDUCATIONAL COMPONENTS

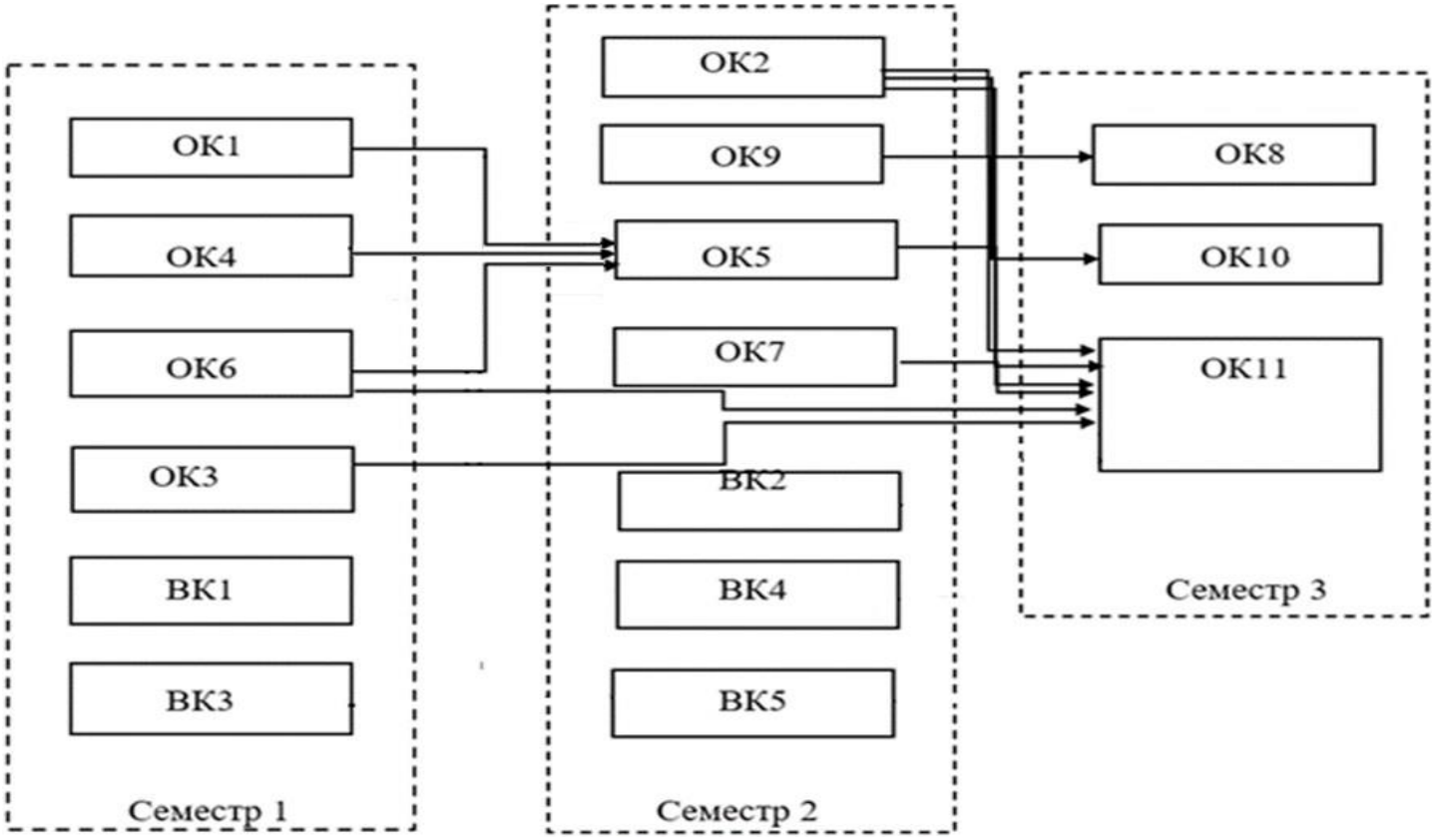
No	Educational components (educational disciplines, course projects (jobs), practices, qualification work)	Credits ECTC	Structure, %
GENERAL TRAINING CYCLE			
1	*MANDATORY EDUCATIONAL COMPONENTS*	*5*	*5%*
2	*ELECTIVE EDUCATIONAL COMPONENTS*	*10*	*11%*
VOCATIONAL TRAINING CYCLE			
3	*MANDATORY EDUCATIONAL COMPONENTS*	*60*	*67%*
4	*ELECTIVE EDUCATIONAL COMPONENTS*	*15*	*17%*
THE TOTAL NUMBER OF		***90***	***100%***
including: selective component		*25*	*28%*

Code OK	Educational components (educational disciplines, course projects (works), practices, qualification work)	Credits ECTC	Forms of the summary control
GENERAL TRAINING CYCLE			
MANDATORY EDUCATIONAL COMPONENTS			
OK1	SCIENTIFIC RESEARCH METHODOLOGY (English)	5	TEST
ELECTIVE EDUCATIONAL COMPONENTS			
VK1	MAG-MINOR	5	TEST
VK2	MAG-MINOR	5	TEST
VOCATIONAL TRAINING CYCLE			
MANDATORY EDUCATIONAL COMPONENTS			
OK2	METHODS OF TESTING AND QUALITY ASSESSMENT OF SOFTWARE SYSTEMS	4	TEST
OK3	INFORMATION SYSTEMS IN THE ORGANIZATION AND MANAGEMENT OF IT ENTERPRISES	5	EXAM
OK4	DISTRIBUTED DATA STORAGE	5	TEST
OK5	CLOUD COMPUTING	5	EXAM
OK6	HIGH-PERFORMANCE SYSTEMS OF PROCESSING AND ANALYSIS OF BIG DATA	5	EXAM
OK7	MODERN METHODOLOGIES AND DEVELOPMENT ENVIRONMENTS OF COMPUTER INFORMATION SYSTEMS	5	TEST
OK8	COMPLEX TRAINING	3	REPORT
OK9	COURSEWORK	1	COURSE WORK
OK10	PRE-DIPLOMA PRACTICE	10	REPORT
OK11	GRADUATE WORK	17	DIPLOMA WORK
ELECTIVE EDUCATIONAL COMPONENTS			
VK3	MAJOR 1	5	EXAM
VK4	MAJOR 2	5	EXAM
VK5	MAJOR 3	5	EXAM

4.2 ELECTIVE COMPONENT OF THE EDUCATIONAL AND PROFESSIONALPROGRAM

Students are given the opportunity to freely choose academic disciplines. The chosen disciplines will be included in the individual study plan of each student, and the study results will be reflected in the supplement to the diploma. The principle of free choice enables each studentto study academic disciplines that reflect individual preferences, interests and plans for future employment. Registration for the selective component of the educational and professional training program takes place on the basis of an application form that is filled out and submitted to the relevant dean's office. The elective component consists of two MA-MINOR disciplines (develop and shape overall learning outcomes). Master's minors are chosen from the general pool of disciplines of Khneu National University named after S. Kuznets. As well as three MAJOR disciplines (deepen professional competences and learning outcomes)/

4.3. STRUCTURAL AND LOGICAL SCHEME OF THE TRAINING OF HIGHER EDUCATION ACQUIRES of the second (master's) level of higher education OP "Computer Science"



V. FORMS OF CERTIFICATION OF HIGHER EDUCATION ACQUIRES

Attestation forms students of higher education	Attestation in the specialty is carried out in the form of public defense of the qualification work in the specialty 073 Management of the educational program Business administration (full-time and extramural forms of study) Students who have fulfilled all the requirements of the educational and professional program and the curriculum are admitted to the attestation.
Requirements to qualification work	Semyon Kuznets Kharkiv National University of Economics develops and approves: regulations on the examination commission (EC); the procedure for checking qualifying diploma master's theses for plagiarism; norms of uniqueness of the texts of qualification diploma theses. Attestation of persons obtaining a master's degree is carried out by the EC, which may include representatives of employers and their associations. Attestation is carried out openly and publicly. A qualifying master's thesis is allowed to be defended before the EC, provided that the level of its uniqueness (originality) corresponds to the standard officially approved by the Semyon Kuznets Kharkiv National University of Economics. Requirements for the final qualification work: A qualifying master's thesis is a student's educational and scientific work, which is performed at the final stage of obtaining a master's degree in management in order to establish the compliance of the learning results (competencies) obtained by higher education applicants with the requirements of higher education standards. It is a qualification document on the basis of which the EC determines the level of theoretical training of the graduate, his readiness for independent work in the field and makes a decision on assigning the appropriate qualification and issuing a diploma. The qualifying master's thesis is a tool for consolidating and demonstrating the general and special competences formed during training in accordance with the profile of the chosen specialty. The qualification work should involve solving a complex problem or problem in the field of management, a problem or problem in the field of management that requires research and/or innovation and is characterized by the complexity and uncertainty of conditions, with the application of theories and methods of economic science. For publication and public familiarization with the content of qualification theses and prevention of academic plagiarism, diploma theses must be posted on the official website of Semyon Kuznets Kharkiv National University of Economics.

Requirements for public protection	In the process of public defense, a candidate for the award of a master's degree must demonstrate the ability to clearly and confidently present the content of the conducted research, reasonedly answer questions and lead a discussion. The student's report must be accompanied by presentation materials and an explanatory note intended for public viewing. The examination commission's decision to award a master's degree in management and issue a master's degree based on the results of the final attestation of students is announced after the minutes of the examination commission's meetings are drawn up in the established order.

VI. REQUIREMENTS FOR THE PRESENCE OF AN INTERNAL SYSTEM QUALITY ASSURANCE OF HIGHER EDUCATION

The requirements for the internal quality assurance system at the University are developed on the basis of European standards and recommendations for quality assurance of higher education (ESG), Article 16 of the Law of Ukraine "On Higher Education", Standard of Higher Education in the specialty 122 Computer Sciences.

Policy regarding quality assurance higher education	The main principles of internal quality assurance of education at the KHNEU named after S. Kuznets: responsibility; compliance; adequacy; autonomy; measurability; academic culture; openness The main procedures for internal quality assurance of education at Khneu National University named after S. Kuznets: formalization of quality policy, strategic goals, tasks of continuous quality improvement; ensuring publicity of information about educational programs, degrees of higher education and qualifications; ensuring compliance with academic integrity by employees of higher education institutions and students of higher education; preparation and conduct of marketing-monitoring and social-psychological studies to determine the needs of the labor market, the requirements of higher education stakeholders, the quality of the provision of educational services and satisfaction with the quality of educational activities and the quality of education; involvement of higher education stakeholders (higher education students, employers, representatives of the academic community, etc.) before making decisions in the areas of internal quality assurance; external evaluation of the quality of activity of KhNEU named after S. Kuznets based on the results of participation in national and international rankings of higher educational institutions, fulfillment of Licensing requirements, accreditation. Directions: development, approval, monitoring and periodic review of educational programs; ensuring professional development of pedagogical, scientific and scientific-pedagogical workers; ensuring student-centered learning, teaching and assessment of higher education applicants; ensuring availability necessary resources for the organization of process; educational provision of information systems for effective management of the educational process.

Quality assurance development, approval, monitoring, viewing and educational updates programs	Monitoring and periodic review of educational programs is carried out in accordance with the current regulations at Khneu National University named after S. Kuznetsa. The review of educational programs is carried out on the basis of the analysis of meeting the educational needs of those seeking higher education: the possibility of building an individual learning trajectory, observing academic freedoms in the educational process, satisfaction with the quality of the educational program, etc.; employers: quality of formation of general and professional competences, actual and social skills (soft skills); other stakeholders. To review educational programs, the following are used: online survey, focus group research, document analysis, situation analysis, by group in accordance with the requirements for the structure and content of the educational program. Periodicity of revision of educational programs is carried out: a) annually according to the results of monitoring; b) after completion of the educational program by higher education students, c) in the event of a change in the legislative and regulatory framework.
Software enrollment, achievement, recognition and certification acquirers	Evaluation of higher education applicants is consistent, transparent andis conducted in accordance with the procedures established by the University in accordance with regulations. The annual assessment of education seekers is carried out in accordance with the forms of control determined by the educational program; the procedure for evaluating the results of training, which is highlighted in the work programs of educational disciplines, work plans (technological maps) of educational disciplines, syllabi of educational disciplines; accounting of learning results, which is conducted using the information environment of the Personal Learning System (PNS) of the University. Evaluation of higher education applicants is carried out on the basis of a 100-point accumulative point-rating system.
Quality assurance student-centered teaching, teaching andassessment	The planning, distribution and provision of educational resources and provision of support for higher education students take into account their needs and the principles of student-centered learning. Internal quality assurance of higher education ensures that all necessary resources meet the learning objectives, are publicly available, and higher education seekers are informed of their availability.
Quality assurance scientifically-pedagogical employees	Annual rating assessment activity scientifically-of pedagogical workers, departments and faculties of the University is carried out through the use of mechanisms for evaluation and self- evaluation of the effectiveness of scientific and pedagogical activity, its focus on the priorities of the development of the national system of higher education, the development strategy of the University, personal professional development of scientific and pedagogical workers. The results of the rating evaluation are summarized based on the results of activities achieved during the calendar year. The results of the annual evaluation of scientific and pedagogical workers, departments and faculties are announced at the meeting of the academic council of the University.
Resourceful software educational process (educational resources and support of	The institution of higher education provides the educational process with the necessary and available resources (personnel, methodical, material, informational, etc.) and provides appropriate support to students of higher education. Organizational and methodical support independent work students of higher education consists in the development of methodical, didactic, instructional materials, providing the opportunity to form, consolidate, deepen and systematize the knowledge and skills acquired

acquirers higher education)	duringclassroom classes, to carry out self-training and self-monitoring of the mastery of the educational and professional program and is implemented through the Personal Educational System of Khneu National University named after S. Kuznetsa.
Informational software (informative management)	In order to manage the educational process, an effective policy in the field of information management and a corresponding integrated information system for managing the educational process have been developed. This system provides automation of basic functions management of the educational process, in particular: ensuring the introduction campaign, planning and organization of the educational process; access to educational resources; accounting and analysis of success of higher education applicants; administration of the main and auxiliary processes of providing educational activities; personnel management, etc.
Publicity information about educational programs, educational, scientific activity	Reliable, objective, up-to-date, timely and easily accessible information on the educational and professional program is published on the website of KhNEU. S. Kuznets, including programs for potential students of higher education, graduates, other stakeholders and the public. Information about educational activities in a specialty, including selection criteria for studies, is public; planned learning outcomes under this program; learning, teaching and assessment procedures used.
Software academic integrity	Ensuring the prevention and detection of academic plagiarism in the scientific works of employees of the higher education institution and students of higher education is implemented through the policy, standards and procedures of compliance with academic integrity, regulated by such documents of KhNEU named after S. Kuznets: Code of academic integrity; Code of professional ethics and organizational culture of employees and students of higher education of Khneu National University named after S. Kuznets; Regulations on the Commission on Academic Integrity of Khneu National University named after S. Kuznetsa. The verification of scientific works of scientific and pedagogical workers of the University and students of higher education is carried out with the help of Internet services based on open Internet resources and the StrikePlagiarism.com system, which operates on the basis of the License Agreement on granting the right to use anti-plagiarism software.

EXPLANATORY NOTE

Matrix compliance with those defined by the Standard (by available)
of competencies to the NQF descriptors and the correspondence matrix of the learning outcomes and competencies defined by the Standard are presented in Tables 1 and 2.

Table 1

Correspondence matrix of defined competences to NRK descriptors

Classification competence for NRK	**Knowledge** **Zn1**Specialized conceptual knowledge, what include modern scientific achievements in the field professional activity or there are fields of knowledge the basis fororiginal thinking and carrying out of research **Zn2**Critical understanding problemsin the industry and on the border of industries of knowledge.	**Skills/skills** **Mind1**Specialized ability/skills problem solving necessary for conductingresearch and/or proceedings innovative activity with with the aim of developing new ones knowledge and procedures. **Mind2**Ability integrate knowledge and to solve complex problems in broad or multidisciplinary ones contexts. **Mind3**Ability solve problems in new or unfamiliar environments if available incomplete or limited information taking into account aspects of social and ethical responsibility.	**Communication** **K1** It is clear and Unambiguous reporting own knowledge, conclusions and arguments to specialists andnon-specialists, in particular to persons who are studying	**Responsibility and autonomy** **AB1**Management workers or educational processes that are complex, unpredictable and need new strategic ones approaches **AB2** Responsibility for contribution to professional knowledge and practices and/or assessment results team activities and collectives.**AB3**Ability continue learning with high degree of autonomy.
General competences				
ZK01. Ability to abstract thinking, analysis and synthesis		Mind1		
ZK02. Ability apply knowledge in practical situations	Zn1	Mind3		AB1
ZK03. Ability communicate in the state language as orally and in writing.			K1	
ZK04. Ability communicate in a foreign language.			K1	
ZK05. Ability learn and master modern knowledge.				AB3
ZK06. The ability to be critical an self-critical	d Zn2			
ZK07. Ability generate new ideas (creativity).		Mind1		
ZK08. Ability work in a team.	Zn2		K1	AB2

Special (professional) competences				
SK01. Awareness theoretical foundations of computer sciences.	Zn1	Mind2		
SK02. Ability to formalize objective regioncertain project in in the form corresponding informative models	Zn1	Mind3		
SK03. Ability use mathematical methods for analysis formalized subject models region	Zn2			
SK04. Ability collect and analyze data (incl witbig ones) for software quality adoption of project decisions.	Zn1	Mind1		AB1
SK05. Ability elaborate, describe, analyze and optimize architectural solutions information and computer systems various purposes.	Zn1	Mind3		
SK06. Ability apply existing and develop new ones algorithms solving problems in computer industry of science	Zn1	Mind1		
SK07. Ability elaborate software software in accordance to formulated requirements taking into account available resources and restrictions	Zn2	Mind2		AB1
SK08. Ability elaborate animplemen creation projects software provision, in that number of in unpredictable under unclear conditions requirements and necessity apply new ones strategic approaches, use	d Zn1	Mind1, Mind3	K1	

Software tools for team organization work on the project.				
SK09. Ability elaborate andto administer base data and knowledge.	Zn1	Mind2		
SK10. Ability evaluate andprovide quality IT projects, informative and computer systems various purposes, apply international standards evaluations software quality software informative and computer systems, models evaluations maturity processes developments informative and computer systems	Zn1	Mind1, Mind3		AB2
SK11. Abilityto initiate plan and implement development processes information and computer systems and software software, including him development, analysis, testing, systemic integration, implementation an escort	Zn1 d	Mind1, Mind2	K1	AB2, AB3
SK12. Ability apply existing and elaborate new ones algorithms solving problems in industry computer Sciences: algorithmssolving computing and logical tasks; algorithms parallel and distributed calculatio ns; algorithm s analytical processing and	Zn1	Mind1		AB1, AB3

intellectual analysis data (in ago number of and large) with an estimate their effectiveness and complexities				
SK13. Ability to test software software computer informative systems, perform modular, system and integration testing applications and bases data (including big data) with assessment results testing	Zn1	Mind1		AB1
SK14. Ability quantitatively and qualitatively evaluate level management and planning quality, implementation and implementation IT projects byhelp defined metric and characteristics efficiency and productivity.	Zn1, Zn2	Mind2	K1	AB1, AB2

Table 2

Correspondence matrix of defined learning outcomes and competencies

Software the results teaching	General competences								Special (professional) competences													
	ZK1	ZK2	ZK3	ZK4	ZK5	ZK6	ZK7	ZK8	SK1	SK2	SK3	SK4	SK5	SK6	SK7	SK8	SK9	SK10	SK11	SK12	SK13	SK14
PH1		OK1 OK7 OK8	OK1		OK5 OK6		OK3 OK7 OK8					OK3 OK6 OK8			OK1 OK6 OK8	OK1 OK3 OK5					OK2	OK3
PH2	OK1 OK3 OK11				OK1 OK8 OK11				OK7 OK8	OK3 OK7 OK8 OK11	OK3, OK7, OK8		OK5 OK6 OK8	OK2 OK6 OK8			OK2 OK6 OK8	OK5 OK6		OK1 OK6	OK1	OK3
PH3	OK6		OK1		OK8 OK10 OK11				OK3 OK7 OK11				OK3 OK4 OK6 OK8							OK6	OK2	OK3
PH4		OK2 OK3 OK7			OK6				OK4 OK6	OK2 OK6 OK7	OK1 OK2 OK7	OK2 OK7		OK1 OK2 OK6				OK2 OK7 OK11				
PH5	OK4 OK6		OK3 OK8	OK3 OK8	OK3 OK8	OK7 OK8	OK3 OK8				OK3 OK4 OK8	OK2 OK5 OK8	OK6		OK1 OK6 OK8	OK1 OK6 OK8	OK1 OK6	OK3	OK4 OK6			
PH6	OK1 OK3 OK6		OK1 OK3 OK6		OK2		OK4 OK5		OK3 OK6	OK4 OK7		OK1 OK2 OK8	OK4 OK6			OK2 OK6	OK3 OK6			OK2 OK6		
PH7	OK1 OK4 OK5		OK1 OK4 OK5		OK6 OK7 OK8	OK3, OK6	OK3 OK6 OK8		OK4 OK5 OK6		OK7 OK8	OK1 OK6 OK8	OK1 OK6 OK8								OK2	
PH8	OK1 OK6		OK1 OK6		OK3 OK5		OK6							OK5 OK6						OK6		
PH9	OK1 OK6		OK1 OK6 OK7		OK1 OK7 OK8	OK1	OK6	OK2					OK3 OK6					OK2 OK3		OK1 OK2		
PH10	OK2 OK3	OK3 OK7		OK1 OK2	OK3 OK7		OK2 OK5	OK2		OK2			OK3 OK7									OK3
PH11	OK2 OK6 OK7	OK3 OK2	OK2 OK6 OK7	OK2	OK6 OK7 OK11		OK3 OK7			OK2 OK7 OK				OK6 OK7 OK8			+					
PH12	OK4 OK5			OK2	OK4 OK5		OK4 OK5										OK4 OK5	OK2 OK6				
PH13		OK2 OK3	OK2 OK7 OK8		OK2		OK2		OK1 OK8						OK2, OK3			OK2 OK3				

Software the results teaching	General competences								Special (professional) competences													
	ZK1	ZK2	ZK3	ZK4	ZK5	ZK6	ZK7	ZK8	SK1	SK2	SK3	SK4	SK5	SK6	SK7	SK8	SK9	SK10	SK11	SK12	SK13	SK14
PH14		OK2		OK2	OK1 OK2		OK2										OK2, OK3,	OK2	OK2 OK7	OK2, OK3, OK?+		
PH15		OK3			OK1 OK3		OK2		OK2			OK2, OK3, OK6		OK2, OK3, OK6					OK3 OK2			
PH16		OK1		OK2	OK1		OK1				OK2, OK3, OK6						+	+		OK8-OK11		
PH17		OK2			OK1 OK2		OK2		OK2				OK2, OK4, OK5							OK8, OK11		OK3
PH18		OK2 OK3 OK7		OK1 OK3 OK5 OK6	OK1 OK2		OK2 OK7 OK11		OK1 OK8	OK2 OK3 OK7		OK6 OK7	OK1, OK6, OK8		+		+		OK2 OK7 OK8 OK10 OK11	OK8, OK11		OK2 OK3
PH19		OK1 OK8 OK11		OK1 OK3 OK5 OK6	OK1 OK8 OK11		OK1 OK8 OK10 OK11											OK1 OK9 OK10 OK11		OK1, OK7, OK8, OK9		
PH 20		OK3		OK3			OK3		OK3						OK2						OK3	OK2 OK3
PH21		OK4 OK5 OK6		OK6 OK5 OK4			OK4 OK5 OK6		OK5 OK6						OK2 OK6						OK6	OK7 OK6

Guarantor OP *(signed)* **Sergey MINUKHIN**

ЛИСТ ПОГОДЖЕННЯ
Освітньо-професійної програми «Комп'ютерні науки»

Назва структурного / функціонального підрозділу / посадова особа	**Підпис**
1. Навчально-методичний відділ	
2. Відділ забезпечення якості освіти	
3. Завідувач випускової кафедри	
4. Проректор з навчально-методичної роботи	

Товариство з обмеженою відповідальністю «ЕПАМ СИСТЕМЗ»

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ЄДРПОУ 33880213, п/р UA583808050000000026000383792 в ПАТ «Райффайзен Банк Аваль»

РЕЦЕНЗІЯ-ВІДГУК

на освітньо-професійну програму «Комп'ютерні науки»
другого (магістерського) рівня вищої освіти
за спеціальністю 122 «Комп'ютерні науки»,
підготовлену кафедрою інформаційних систем
Харківського національного економічного університету імені Семена Кузнеця

Освітньо-професійна програма (ОПП) за спеціальністю 122 «Комп'ютерні науки» являє собою систему документів, розроблену і затверджену закладом вищої освіти з урахуванням вимог ринку праці, та регламентує цілі, компетентності, очікувані результати навчання, зміст, навчальний план підготовки здобувачів вищої освіти, умови та технології реалізації освітнього процесу, оцінку якості підготовки випускника за даною спеціальністю.

В ОПП, що подана до рецензування, особлива увага приділяється формуванню сучасних навичок майбутніх фахівців ІТ галузі, готових до професійної діяльності на всіх рівнях практичної діяльності, до творчого розв'язання різного роду фахових проблем і задоволення потреб клієнтів на основі результатів наукового пошуку та фактичних даних практики у галузі комп'ютерних наук, супроводу комп'ютерних систем задля аналізу та обробки даних в організаційних, технічних, природничих та соціально-економічних системах (різної природи) та здатних до саморозвитку, самоактуалізації, самореалізації.

ОПП побудовано на засадах компетентнісного підходу до організації освітнього процесу. Програма спрямована на розвиток актуальних для сучасного спеціаліста ІТ-галузі інтегральних, загальних та спеціальних компетентностей. Спеціальні компетентності мають практичний характер і можуть бути використані у професійній діяльності майбутніх фахівців.

ОПП складена логічно, дисципліни навчального плану відображають актуальні для ІТ галузі теми. Послідовність вивчення навчальних дисциплін, перелік та обсяг базових та вибіркових навчальних дисциплін відповідають структурно-логічній схемі підготовки здобувачів вищої освіти за спеціальністю 122 «Комп'ютерні науки» і покликані сприяти забезпеченню відповідності програмних результатів навчання запитам стейкхолдерів.

Рецензована ОПП має необхідні структурні та змістовні складові, враховує сучасні вимоги до випускників спеціальності 122 «Комп'ютерні науки» галузі знань 12 «Інформаційні технології», а саме, включає вибіркові є базові та вибіркові дисципліни (мейджори та маг-майнори) професійного циклу, а також вибіркові непрофесійні дисципліни (майнори) має самостійний, творчий характер та є завершеною. Рівень підготовки та практична цінність є належними. Індивідуальна траєкторія навчання здобувачів забезпечується вибором здобувачів з 3-х мейджорів: "Інформаційні системи управління та технології обробки даних", що включає навчання з високопродуктивних систем обробки великих даних, розподілені сховища даних, методи оптимізації в задачах управління тощо, "Інтелектуальні інформаційні системи і технології", в якому розглядаються питання побудови інтелектуальних ІУС і технологій їх розробки, нейромережеві методи прогнозування економічних часових рядів тощо, та "Бізнес

аналітика та інформаційні системи в підприємництві“, що включає навчання з таких дисциплін “Статистичне мислення для науки про дані“, “Бізнес інтеленденс“, “Основи аналізу даних“. Це свідчить про спрямованість ОПП на різні ланки та сфери ІТ-підприємтсв, що сприяє підвищенню підготовки здобувачів відповідно до потреб ринку праці.

Враховуючи вищенаведене, ОПП «Комп’ютерні науки» другого (магістерського) рівня вищої освіти за спеціальністю 122 «Комп’ютерні науки» Харківського національного економічного університету імені Семена Кузнеця відповідає сучасним вимогам до підготовки фахівців за спеціальністю 122 «Комп’ютерні науки» та рекомендується для впровадження в навчальний процес та для її практичного використання.

Генеральний директор
ТОВ «ЕПАМ СИСТЕМЗ» **О.І. Чеботар**

товариство з обмеженою відповідальністю

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Вих. № _
від « __» _____ р.

РЕЦЕНЗІЯ-ВІДГУК

на освітньо-професійну програму «Комп'ютерні науки»
другого (магістерського) рівня вищої освіти
за спеціальністю 122 «Комп'ютерні науки»,
підготовлену кафедрою інформаційних систем
Харківського національного економічного університету імені Семена Кузнеця

Освітньо-професійна програма (ОПП) являє собою систему документів, що визначає передумови доступу до навчання, орієнтацію та основний фокус програми, обсяг кредитів ЄКТС, необхідний для здобуття освітнього ступеня магістра, перелік загальних та спеціальних (фахових) компетентностей, нормативний і варіативний зміст підготовки фахівця, сформульований у термінах результатів навчання та вимоги до контролю якості вищої освіти.

В ОПП особлива увага приділяється формуванню у студентів грунтовної системи знань у сфері інформаційно-комунікаційних технологій, програмування, системних досліджень, використання основного інструментарію штучного інтелекту, методів проектування інформаційних управляючих систем, а також базової економічної підготовки й отримання практичного досвіду з розроблення, впровадження та супроводу інформаційних систем і технологій у різних галузях економіки та техніки

ОПП побудовано на засадах компетентнісного підходу до організації освітнього процесу. Програма спрямована на розвиток актуальних для сучасного спеціаліста ІТ галузі інтегральних, загальних та спеціальних компетентностей. Спеціальні компетентності мають практичний характер і можуть бути використані у професійній діяльності майбутніх фахівців, готових до професійної діяльності на всіх рівнях практичної діяльності, до творчого розв'язання різного роду фахових проблем і задоволення потреб клієнтів на основі результатів наукового пошуку та фактичних даних практики у галузі комп'ютерних наук, супроводу комп'ютерних систем задля аналізу та обробки даних в організаційних, технічних, природничих та соціально-економічних системах (різної природи) та здатних до саморозвитку, самоактуалізації, самореалізації.

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