3. Profile of the educational program in the specialty 122 "Computer Science" (specialization "Computer Science")

The head of the working group (guarantor of the educational program) – Candidate of Physical and Mathematical Sciences, Associated Professor of the Department of Computer Science and Information Systems Filimonova T.O.).

1 –General information	
Full name of the institution of higher education and structural subdivision	Kyiv National University of Trade and Economics **Faculty of Information Technologies** **Department of Computer Science and Information Systems**
Higher education degree and the name of the qualification in the language of the original	Degree of higher education: junior bachelor Specialty "Computer Science" Educational and professional program "Computer Science"
The official name of the educational program	"Computer Science"
Type of diploma and volume of educational program	Junior bachelor's degree diploma, initial, 120 ECTS credits, term of study: 1 year and 10 months
Availability of accreditation	Initial accreditation is scheduled for 2022
Cycle / Level	NQF of Ukraine - 5th level FQ for EHEA – short cycle EQF for LLL – 5th level
Prerequisites	Full secondary education
Language (s) of teaching	Ukrainian
The duration of the educational program	-
Internet address of the permanent placing of the educational program	https:// knute.edu.ua
2 –The purpose of the educational program	
To provide quality education in the field of information technology which is competitive in the labor market, to prepare students with a special interest in the field of computer science, ready to study for a bachelor's degree.	
3 - Characteristics of the educational program	
Subject area (branch of knowledge, specialty, specialization (if any))	Branch of Knowledge 12 “Information Technologies” Specialty 122 “Computer Science” Educational and professional program: "Computer Science"
Orientation of the educational program	Educational and professional, fundamental, applied. The main emphasis of the educational program is on the training of specialists capable of solving complex problems related to modeling, design, development, software implementation and maintenance of

	computer systems and technologies, including on the basis of distributed server systems and using intelligent mechanisms of analysis and data processing.
The main focus of the educational program and specialization	General education in the field of information technologies, educational and professional program "Computer Science". *Keywords:* programming, algorithmization, modeling, computer data processing, computer systems and technologies, C # programming, C ++, Python
Peculiarities of the program	Availability of a variable component of professionally-oriented disciplines for computer science; practical training in government agencies, enterprises and organizations. A feature of the educational program "Computer Science" is its content, which takes into account current trends in information technology and is aimed at the development and implementation of intelligent control systems.
4 – Suitability of graduates for employment and further education	
Suitability for employment	According to the National Classification of Economic Activities DK 009: 2010, as well as taking into account the requirements of the labor market, the types of professional activity of the graduate are: - activities in the field of informatization - 72; - software development and provision of relevant consultations - 72.2 The specialist of the educational degree "Junior bachelor" of the specialty "Computer science" according to the National classifier of professions DK 003: 2010 can be employed for positions with the following professional title: 3121.2 Information Technology Specialist;
Further training	Continuation of education at the first (bachelor's) level of higher education in bachelor's educational programs in the field of knowledge "Information Technology" and in interdisciplinary programs
5 –Teaching and evaluation	
Teaching and training	Lectures, practical classes, laboratory work, seminars, self-study with the use of textbooks, manuals and abstracts, consultations with teachers, preparation for the qualifying exam. Student-centric approach to training. Credit-transfer system of training organization. Individual learning trajectory. Problem-oriented learning, self-learning (using the resources of the library and the Internet), learning through practical training. Distance learning using electronic resources in the Moodle system.
Evaluation	Current control, exams, qualifying exam. Assessment is carried out in accordance with the "Regulations on the assessment of learning outcomes of students and graduate students", "Regulations on the organization of the educational process of students"
6 –Program competencies	
Integral competence	The ability to solve typical specialized problems in the field of *computer science* or in the learning process, which involves the application of the provisions and methods of the relevant sciences and is characterized by a certain uncertainty of conditions; be responsible for the results of their activities and the activities of others in certain situations.
General competences (GC)	GC1. The ability to abstract thinking, analysis and synthesis. GC2. The ability to apply knowledge in practical situations.

	GC3. The knowledge and understanding of the subject area and understanding of the professional activity. GC4. The ability to communicate in the state language both orally and in writing. GC 5. The ability to communicate in a foreign language. GC 6. The ability to learn and master modern knowledge. GC 7. The ability to search, process and analyze information from various sources.
Special (professional, subject area) competences	SC1. The ability to formulate mathematically and study continuous and discrete mathematical models, justify the choice of methods and approaches for solving theoretical and applied problems in the field of computer science, analysis and interpretation. SC 2. The ability to detect statistical patterns of nondeterministic phenomena, the use of methods of computational intelligence, including statistical, neural network and fuzzy data processing, methods of machine learning and genetic programming, etc. SC 3. The ability to think logically, build logical conclusions, use formal languages and models of algorithmic calculations, design, development and analysis of algorithms, evaluate their efficiency and complexity, solvability and unsolvability of algorithmic problems for adequate modeling of subject areas and creation of software and information systems . SC 4. The ability to use modern methods of mathematical modeling of objects, processes and phenomena, to develop models and algorithms for numerical solution of mathematical modeling problems, to take into account the errors of approximate numerical solution of professional problems. SC5. The ability to provide a formalized description of operations research tasks in organizational, technical and socio-economic systems for different purposes, determine their optimal solutions, build models of optimal management taking into account changes in the economic situation, optimize management processes in different systems and hierarchies. SC6. The ability to system thinking, application of system analysis methodology to study complex problems of different nature, methods of formalization and solution of system problems that have conflicting goals, uncertainties and risks. SC7. The ability to apply the theoretical and practical foundations of methodology and modeling technology to study the characteristics and behavior of complex objects and systems, to conduct computational experiments with processing and analysis of results. SC8. The ability to design and develop software using different programming paradigms: generalized, object-oriented, functional, logical, with appropriate models, methods and algorithms of calculations, data structures and control mechanisms.
7 –Program outcomes of the training	
	POT 1. To apply knowledge of the basic forms and laws of abstract-logical thinking, the basics of the methodology of scientific knowledge, forms and methods of extraction, analysis, processing and synthesis of information in the subject area of computer science. **POT**2. To use a modern mathematical apparatus of continuous and discrete analysis, linear algebra, analytical geometry, in professional activities to

	solve problems of theoretical and applied nature in the design and implementation of informatization objects. **POT 3.** To use the knowledge of the laws of random phenomena, their properties and operations on them, models of random processes and modern software environments to solve problems of statistical data processing and construction of predictive models. **POT 4** To use 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. **POT 5.** To 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. **POT 6.** To use methods of numerical differentiation and integration of functions, solution of usual differential and integral equations, features of numerical methods and possibilities of their adaptation to engineering problems, to have skills of program realization of numerical methods. **POT 7.** To understand the principles of modeling organizational and technical systems and operations; use methods of operations research, solving one- and multi-criteria optimization problems of linear, integer, nonlinear, stochastic programming.
8 –Resource support for the implementation of the program	
Personnel support	The implementation of the educational program is provided by teachers who have the degrees of candidate and doctor of sciences. The participation of foreign specialists and practitioners in the teaching of disciplines of the training cycle is possible.
Material and technical support	The basis of material and technical support includes specialized computer laboratories with modern hardware and software resources that provide quality training for junior bachelors in the educational program "Computer Science". Students are fully provided with material resources for teaching and research. At their disposal are: - more than 30 thousand m2 of educational buildings; - dormitories; - 470 seats in the reading rooms of KNUTE, including in the multimedia library of KNUTE, where the access to scientometric databases SCOPUS, Web of Science is provided; - 2000 PC workstations with Internet access + WiFi. All computer equipment is provided with basic software, special software is installed on the computers in the laboratories of the departments, necessary for classes and tasks by students; - Moodle distance learning system, which houses 966 educational courses; - electronic platform for student communication based on Microsoft Office 365, etc.
Information and educational and methodical support	Full provision of educational and methodical complexes of disciplines and other types of educational and methodical materials. Documents regulating the procedures for admission and study at KNUTE are on the official website. Open access of higher education students to information and educational resources through information systems for educational process management and other web-services:

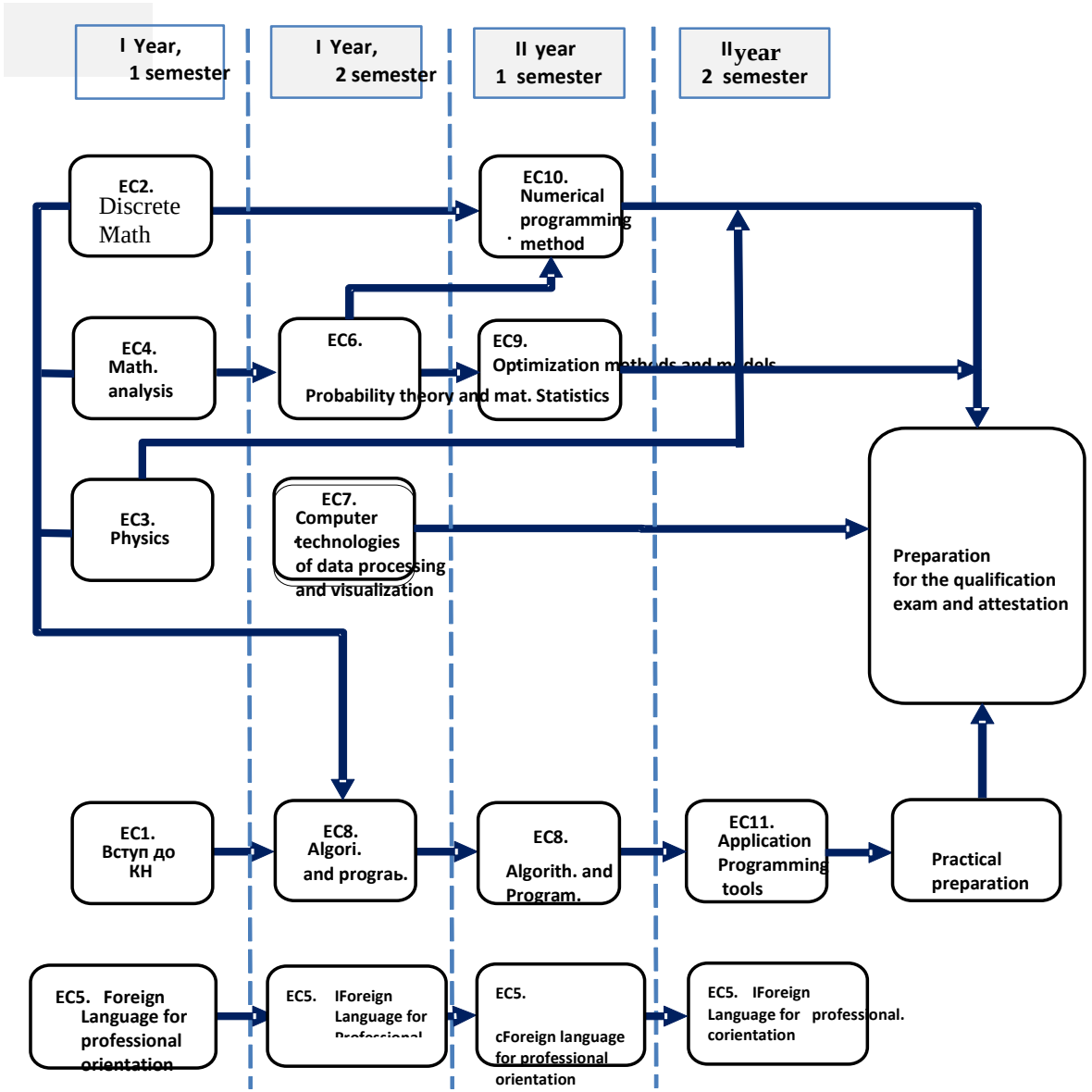
	- system of distance learning MOODLE (966 educational courses, provides independent and individual training, control), - free access to the Internet and e-mail; - information systems "Dean's Office", "Load-schedule", management of WEB-resources KNUTE; - library fund management system - almost 1.5 million items of educational and scientific literature in the library of KNUTE; - electronic document management system "OPTiMA - WorkFlow"; - corporate information environment in the form of a "personal account" of the user of the KNUTE web portal. Ensuring publicity of information about educational programs, degrees of higher education and qualifications: implementation of KNUTE's information policy, publication on the official website of KNUTE of ECTS information packages, educational programs, class schedules, as well as all components of the educational process, which are subject to publication in accordance with the Law of Ukraine "On Higher Education";
9 – Academic mobility	
National credit mobility	National credit mobility is carried out in accordance with the concluded agreements on academic mobility.
International Credit Mobility	International credit mobility is realized within the framework of cooperation agreements between KNUTE and higher education institutions of France, Great Britain, Poland, Germany, within the framework of which partnership exchange and training is carried out. Training in the field of KA1 with obtaining loans at universities of Erasmus + countries.
Teaching foreign applicants for higher education	Foreign applicants for higher education are guaranteed all rights and freedoms, in accordance with current legislation of Ukraine and the Charter of the University. Training of foreign applicants for higher education is carried out on general terms with additional language training.

3.1.1 The list of components of the educational program (EP)

A	Components of the educational program (academic disciplines, course projects (works), practice, qualification exam)	Amount of credits
1	2	3
Compulsory components of the EP		
CC 1.	Introduction to computer science	6
CC 2.	Discrete Math	6
CC 3.	Physics	6
CC 4.	Mathematical analysis	6
CC 5.	Foreign language for professional orientation	21
CC 6.	Probability theory and mathematical statistics	6
CC 7.	Computer technologies of data processing and visualization	6

CC 8.	Algorithmization and programming	12
CC 9.	Optimization methods and models	6
CC 10.	Numerical programming methods	6
CC 11.	Application programming tools	5
Total volume of compulsory components:		**86**
Selective components of the EP		
SC 1.	IT project management	6
SC 2.	Electrical engineering	6
SC 3.	Engineering and computer graphics	6
SC 4.	Automated design systems	6
SC 5.	Vector and tensor analysis	6
SC 6.	Linear algebra and analytic geometry	6
SC 7.	Mathematical logic	6
SC 8.	Theory of algorithms	6
SC 9.	Differential equations	6
SC 10.	Science of law	6
SC 11.	Psychology	6
SC 12.	Life safety	6
SC 13.	Diplomatic and business protocol and etiquette	6
SC 14.	History of Ukrainian Culture	6
SC 15.	Logic	6
SC 16.	Public speaking	6
SC 17.	Management	6
SC 18.	Sociology	6
SC 19.	Philosophy	6
The total amount of selective components:		**30**
Practical training		
Practical training		3
Total		3
Attestation		
Preparation for the qualifying exam and attestation		1
Разом Total		
TOTAL VOLUME OF EDUCATIONAL PROGRAM		**120**

An exam is the form of final control for all components of the educational program.


I Year, 1 semester
I Year, 2 semester
II year 1 semester
IIyear 2 semester
EC2. Discrete Math
EC10. Numerical programming method
EC4. Math. analysis
EC6. Probability theory and mat. Statistics
EC9. Optimization methods and models
EC3. Physics
EC7. Computer technologies of data processing and visualization
Preparation for the qualification exam and attestation
EC1. Вступ до КН
EC8. Algori. and prograь.
EC8. Algorith. and Program.
EC11. Application Programming tools
Practical preparation
EC5. Foreign Language for professional orientation
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3.1.2. Form of attestation of applicants for higher education

The attestation of graduates of the educational program of specialty 122 "Computer Science" is carried out in the form of a qualifying exam and ends with the issuance of a standard document on awarding him or her a bachelor's degree with the qualification: higher education bachelor's degree in "Computer Science", educational and professional program "Computer Science".

The attestation is carried out openly and publicly.

3.1.3. Matrix of compliance of program competencies to the compulsory components of the educational program

Components / Competences	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11
GC 1			•	•					•		
GC 2	•	•	•				•	•	•	•	•
GC 3	•						•	•			
GC 4	•			•							
GC 5					•						
GC 6			•	•		•	•		•		
GC 7						•	•				•
SC 1		•	•	•					•		
SC 2						•					
SC 3								•			
SC 4			•					•	•	•	
SC 5		•							•		
SC 6											
SC 7			•						•	•	
SC 8	•							•			•

3.1.4. Matrix of correspondence of program competences to selective components of the educational program

Components / Competences	SC 1	SC 2	SC 3	SC 4	SC 5	SC 6	SC 7	SC 8	SC 9	SC 10	SC 11	SC 12	SC 13	SC 14	SC 15	SC 16	SC 17	SC 18	SC 19
GC 1																			•
GC 2	•		•	•	•	•		•	•		•	•			•		•	•	•
GC 3		•													•				•
GC 4													•			•			
GC 5																•			
GC 6			•	•						•	•		•	•			•	•	•
GC 7	•				•					•	•	•							
SC 1						•			•										
SC 2					•														
SC 3					•	•	•	•							•				
SC 4					•			•											
SC 5							•												
SC 6																			
SC 7																			
SC 8								•											

3.1.5. Matrix for providing program training outcomes with relevant compulsory components of the educational program

Components / Program learning outcomes	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11
PO 1	•		•	•			•				
PO 2		•	•	•					•		
PO 3						•					
PO 4										•	
PO 5					•			•			•
PO 6		•		•					•	•	
PO 7		•							•		

3.1.6. Matrix for providing program training outcomes with relevant selective components of the educational program

Components / Program training outcomes	SC 1	SC 2	SC 3	SC 4	SC 5	SC 6	SC 7	SC 8	SC 9	SC 10	SC 11	SC 12	SC 13	SC 14	SC 15	SC 16	SC 17	SC 18	SC 19
PO 1							•								•				•
PO 2					•	•			•										
PO 3																			
PO 4					•	•			•										
PO 5			•				•	•							•				
PO 6									•										
PO 7																			