3. Profile of educational program in specialty 122 "Computer Sciences" (specialization " Computer Sciences ") Program team manager (program guarantor) is Doctor of Physical and Mathematical Sciences, Professor, head of the Department of Computer Sciences and Information Systems O.I. Purskyi

1- General Information	
Full name of HEI (Higher Educational Institution) and structural unit	Kyiv National University of Trade and Economics Faculty of Information Technology Department of Computer Sciences and Information Systems
Level of higher education and qualification name in the original language	Master's degree Specialty “Computer Sciences” Specialization “Computer Sciences”
Official name of educational program	“Computer Sciences”
Diploma type and volume of the program	Master diploma, a unit, 90 ECTS credits, training period 1 year 4 months
Accreditation	
Cycle / Level	NQF of Ukraine (National Qualifications Framework of Ukraine) – seventh level, FQ-EHEA – second cycle, EQF-LLL– seventh level
Preconditions	Bachelor’s degree
Languages of instruction	Ukrainian
Program validity period	
Internet address for permanent placement of the program description	https://knute.edu.ua/
2 - Educational Program Aim	
Training of highly qualified specialists who have a system of knowledge in the field of information technology, know modern scientific achievements in this field, are able to formulate and solve research problems and summarize their results in their professional activities using fundamental and special applied methods of computer sciences	
3 – Educational Program Characteristics	
Subject Area (field of knowledge, speciality, specialization)	Field of knowledge 12 “Information Technologies” Specialty 122 “Computer Sciences” Specialization “Computer Sciences”
Educational program orientation	Educational and professional, fundamental, applied

Main focus of the educational program and specialization	General higher education of the second (master's) level in the field of information technologies in specialty "Computer Science". Keywords: information technologies, computer design, management technologies, cloud technologies, distributed systems, methods and models of knowledge representation and processing, data mining, enterprise Java programming, functional and logical programming.
Features of the program	Availability of a variable component of professionally-oriented disciplines for computer sciences; practical training in state research institutions, enterprises and organizations.
4 – Graduates' suitability for employment and further learning	
Suitability for employment	Names of professions according to the National Classifier of Ukraine: Classifier of Professions (DK 003: 2010) 213 Computing (computerization) professionals 2131 Professionals in the field of computer systems 2131.1 Researchers (computer systems) 2131.2 Developers of computer systems 2132 Professionals in the field of programming 2132.1 Researchers (programming) 2132.2 Computer software developers 2310 Teachers of universities and higher educational institutions 2310.2 Other teachers of universities and higher educational institutions
Further learning	Opportunity to study in the third level of higher education.
5- Teaching and Assessment	
Teaching and training	Problem-oriented learning, self-study, training through practical training
Assessment	Current control, written exams, defence of the final qualifying work. 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 Competences	
Integral competence (IC)	. Ability to solve complex problems and problems in the field of computer science and / or in the learning process, which involves research and / or innovation and is characterized by uncertainty of conditions and requirements.
General competencies (GC)	GC 1. Ability to abstract thinking, analysis and synthesis. GC 2. Ability to work both individually and in a team. GC 3. Ability to communicate in a foreign language. GC 4. Ability to conduct research at the appropriate level. GC 5. Ability to make informed decisions. GC 6. Ability to search, process and analyze information from various sources. GC 7. Ability to be critical and self-critical. GC 8. Ability to generate new ideas (creativity). GC 9. Ability to identify, pose and solve problems. GC10. Ability to make informed decisions.

Professional Competences (PC)	PC01. Ability to collect, process, analyse, systematize and summarize scientific and technical information, domestic and foreign experience in the field of research, to choose methods and solutions. PC02. Ability to effectively use the methods of structural and system analysis in the design of modern information and analytical and information-management systems for complex large-scale informatization objects and create normative design documentation. PC03. Ability to systematic thinking, application of systems analysis methodology to study complex problems of different nature, methods of formalization and solving system problems that have conflicting goals, uncertainties and risks. PC04. Ability to apply the theoretical and practical foundations of methodology and modelling technology, to implement modelling algorithms to study the characteristics and behaviour of complex objects and systems, to conduct experiments using a modelling program with processing and analysis of results. PC05. Ability to ensure the organization of computational processes in information systems for various purposes, taking into account the architecture, configuration, performance indicators of operating systems and system software. PC06. Ability to apply methods and means of information security, to develop and operate special software for protection of information resources of critical information infrastructure. PC07. Ability to implement high-performance computing based on cloud services and technologies, parallel and distributed computing in the development and operation of distributed parallel information processing systems. PC08. Ability to apply the theoretical and methodological foundations of management and implement the principles and objectives of management in information systems. PC09. Ability to perform tasks of managing complex information systems with modern tools; use modern software packages for corporate business process management. PC10. Ability to apply methods and models of knowledge presentation and processing in intelligent systems and decision support systems.
7 – Program Learning Outcomes (PLO)	
	PLO1. Ability to carry out scientific research on modern issues in the field of computer science in accordance with the methodology of scientific research, methods of scientific knowledge, forms and methods of analysis, processing and synthesis of information. PLO2. The ability to formulate a goal, determine the object, subject and objectives of own research and solve a research problem, for its solving to collect, process and organize information and formulate conclusions. PLO3. Ability to perform all stages of research of complex systems, including the choice of mathematical model of the studied processes, planning a scientific experiment, processing the results, evaluating the parameters of models, researching the stability of mathematical models, setting optimization of research processes and choice of methods. PLO4. Ability to describe fuzzy knowledge and conclusions, to create and analyse appropriate mathematical models by means of the apparatus of fuzzy sets for decision-making in complex and unpredictable conditions. PLO5. Ability to create, select, adapt and use models, methods, algorithms and software to solve typical design problems. PLO6. Ability to use control algorithms in the design and subsequent operation of control systems.

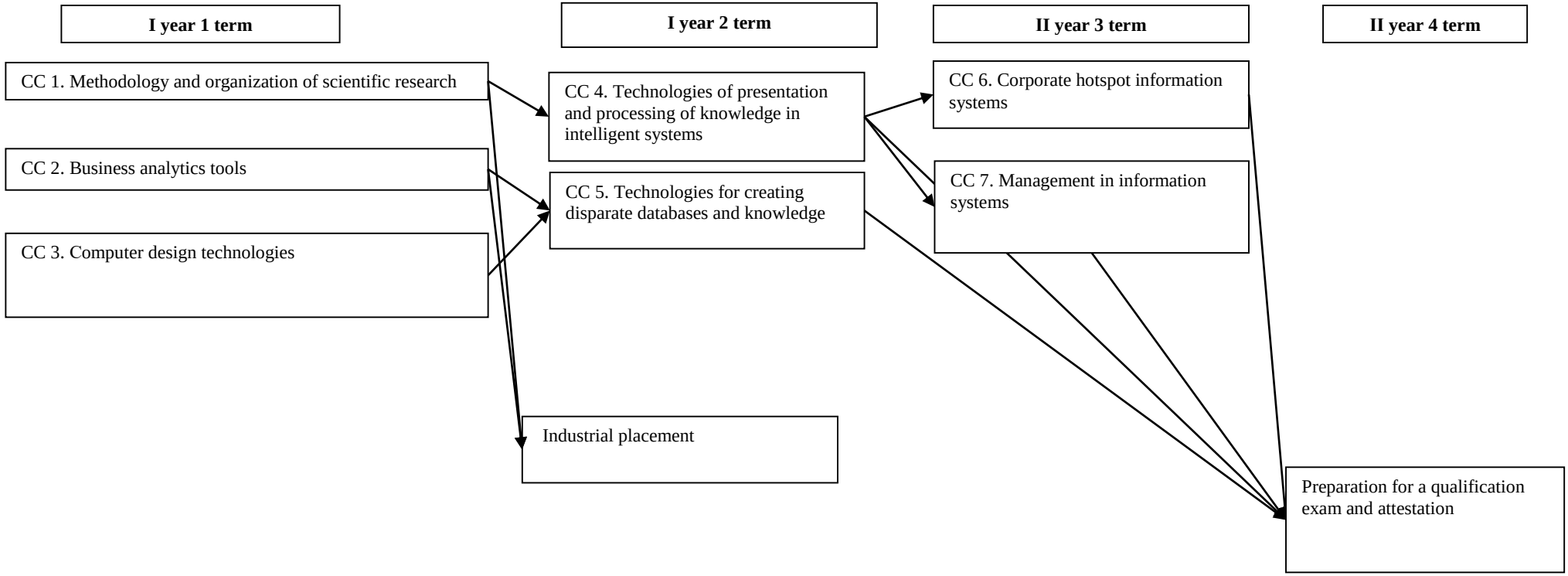
	PLO7. Awareness of existing information technologies to solve professional problems of IT professionals and the ability to make informed choices, adjustments and further operation. PLO8. Ability to work autonomously to solve specific professional and research problems. PLO9. Ability to work effectively in a group, including leadership positions in order to solve a variety of research and practical tasks. PLO10. Ability to perform a mathematical description of the object of control; use methods of variational calculation in control problems; use dynamic control in optimal control tasks; design an enterprise management information system. PLO11. Awareness of the state and prospects of development of business management information systems. Knowledge of architecture and basic technology of corporate information systems. Ability to use modern software packages in the management of corporate business processes. PLO12. Be able to apply the technology of presentation and processing of knowledge in intelligent systems based on existing models of knowledge representation. Know the methods of associative storage of information, similar to those that exist in the human brain. Understand how the form of knowledge representation affects the characteristics and properties of the intelligent system.
8 – Resource support for program implementation	
Staff	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 are specialized computer laboratories with modern hardware and software resources that provide quality training for masters in the educational program "Computer Science". Students are fully provided with material resources for teaching and research. At their service: - more than 30 thousand m2 of educational buildings; - dormitories; - 470 seats in the reading rooms of KNTEU, including in the multimedia library of KNTEU, where access to scient metric databases SCOPUS, Web of Science is provided; - 2000 PC workstations with Internet access + Wi-Fi. All computer equipment is provided with basic software, special software necessary for classes and tasks by students is installed on the computers in the laboratories of the departments; - distance learning laboratory, which houses 966 educational courses; - electronic platform for student communication based on Microsoft Office 365, etc.
Informational and educational-methodical support	Full provision of educational and methodical complexes of disciplines and other types of educational and methodical materials. Documents governing the procedures for admission and study at KNTEU are on the official website. Open access of applicants for higher education to information and educational resources through information systems for managing the educational process 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 KNTEU; - library fund management system - almost 1.5 million items of educational and scientific literature in the library of KNTEU; - electronic document management system "OPTiMA - WorkFlow"; - corporate information environment in the form of a "personal account" of the user of the KNTEU web portal. Ensuring publicity of information about educational programs, degrees of higher education and qualification: implementation of KNTEU's information policy, publication on the official website of KNTEU 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"; Ensuring an effective system of prevention and detection of academic plagiarism in the scientific works of KNTEU employees, applicants for higher education (checking for plagiarism of all final qualifications, publications, publication of dissertation research on the official website of KNTEU), compliance with the Code of Ethics of Ukrainian scientists.
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 implemented within the framework of cooperation agreements between KNTEU and higher education institutions in France, Great Britain, Poland, Germany, within which partnership exchange and training are carried out. Training in the direction of KA1 with obtaining credits in universities of Erasmus + countries
Training of overseas students	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. List of educational program components.

Code	Components of the educational program (academic disciplines, term projects (papers), placement, qualification exam, final qualification work	Number of credits
Compulsory components of EP (CC)		
CC 1	Methodology and organization of scientific research	6
CC 2	Business analytics tools	6
CC 3	Computer aided design technologies	6
CC 4	Technologies of knowledge presentation and processing in intelligent systems	7,5
CC 5	Technologies for creating distributed databases and knowledge	7,5
CC 6	Corporate distributed information systems	6
CC 7	Management in information systems	6
Total Number of Compulsory Components:		**45**
Optional Components of EP (OC)		
OC 1	Situational modelling of risks	6
OC 2	Enterprise Java programming	6
OC 3	Mathematical methods and models of complex economic systems	6
OC 4	Intelligent systems	6
OC 5	Functional and logical programming	6
OC 6	Mobile application development technology	6
OC 7	Business planning	6
OC 8	International technical regulation	6
OC 9	IT law	6
OC 10	Foreign language in information technology	6
Total volume of optional components:		**24**
Practical training:		
Industrial placement		9
Attestation		
Preparation for a qualification exam and attestation		12
Total EP volume:		**90**

For all components of the educational program, the form of final control is an exam


I year 1 term
I year 2 term
II year 3 term
II year 4 term
CC 1. Methodology and organization of scientific research
CC 2. Business analytics tools
CC 3. Computer design technologies
CC 4. Technologies of presentation and processing of knowledge in intelligent systems
CC 5. Technologies for creating disparate databases and knowledge
Industrial placement
CC 6. Corporate hotspot information systems
CC 7. Management in information systems
Preparation for a qualification exam and attestation

3.1.2. Form of attestation of applicants for higher education

Certification of graduates of the specialty 122 "Computer Science" is carried out in the form of defense of the final qualification work and ends with the issuance of a standard document on the award of a master's degree with a qualification: higher education master's degree in "Computer Science" specialization "Computer Science".
Certification is carried out openly and publicly.

3.1.3 Matrix of correspondence of program competences components of the educational program

Components / Competences	GC 1	gc 2	Gc 3	gc 4	gc 5	gc	gc7	gc 1	gc2	gc 3	gc 4	gc5	0gc6	gc	oc 8	gc 9	0c 10
GC 1	•		•				•			•				•			
GC 2				•		•							•				
GC 3	•				•								•				•
GC 4	•	•		•			•									•	
GC 5		•		•	•						•						
GC 6	•		•								•			•			•
GC 7		•									•				•	•	
GC 8	•				•	•			•			•		•			
GC 9	•	•			•	•	•	•		•							
GC 10	•	•	•			•	•	•		•	•						
PC 1	•		•							•					•		•
PC 2				•		•	•				•				•		
PC 3	•	•	•								•			•			
PC 4		•		•				•									
PC 5					•		•		•			•	•				
PC 6					•	•			•			•	•			•	
PC 7					•	•							•				
PC 8				•		•	•	•		•	•			•			
PC 9						•		•		•	•						
PC 10			•									•					

3.1.4. Matrix for providing program learning outcomes with relevant components of the educational program

Components / Program learning outcomes	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	OC 1	OC 2	OC 3	OC 4	OC 5	OC 6	OC 7	OC 8	OC 9	OC 10
PLO1	•									•							
PLO 2	•									•	•						
PLO 3	•	•						•		•							
PLO 4			•					•				•					
PLO 5				•	•	•			•			•	•				
PLO 6		•		•		•	•		•			•	•				
PLO 7		•		•	•	•	•							•	•	•	•
PLO 8	•	•		•	•						•						•
PLO 9	•				•	•	•							•	•	•	•
PLO 10							•			•	•						
PLO 11				•		•			•		•			•			
PLO 12			•							•							