3. Educational programme.

Computer Sciences (educational level “Master’s degree”). Director of the educational programme - Purskyi O.I., Doctor of Sciences (Physics and Mathematics), Professor, head of the Department of Computer Sciences and Information Systems.

3.1. Profile of Educational programme “Computer Sciences” in subject area F3 “Computer Sciences”

1- GENERAL INFORMATION	
Full name of HEI (Higher Educational Institution) and structural unit	State 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	Second (Master's) degree Qualification “Master of Computer Sciences”
Field of study	F “Computer Sciences”
Subject Area	Computer Sciences
Name of the educational programme	Computer Sciences
Restrictions on modes of study	No restrictions
Compliance with the standard of higher education of the Ministry of Education and Science of Ukraine	Complies with the with the standard of higher education of the Ministry of Education and Science of Ukraine (Order No. 393 of 28.04.2022)
Diploma type and volume of the programme	Master diploma, a unit, 90 ECTS credits, training period 1 year 4 months
Accreditation	Certificate of accreditation of the subject area UD 11017030, valid until 01.07.2026
Cycle / Level	NQF of Ukraine (National Qualifications Framework of Ukraine) – seventh level, FQ-EHEA – second cycle, EQF-LLL– seventh level
Preconditions	Bachelor’s degree (6^{th} level) or higher level
Languages of instruction	Ukrainian, English
Programme validity period	Until the new edition of the educational and professional programme is approved
Internet address for permanent placement of the	https://knute.edu.ua/

programme description	
2 - PURPOSE OF THE EDUCATIONAL PROGRAMME	
Training of highly qualified specialists who possess a system of knowledge in the development of mathematical, information and software of computer systems in the field of information technology, in the administration of databases and systems, know the modern scientific achievements of this field, are able to formulate and solve research problems and summarise their results in their professional activities using fundamental and applied methods of computer science.	
3 – CHARACTERISTICS OF THE EDUCATIONAL PROGRAMME	
Subject Area	***Object(s) of study and/or activity:*** the processes of collecting, presenting, processing, storing, transmitting and accessing the information in computer systems. ***Learning objectives:*** acquiring the ability to carry out tasks 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, presentation, processing, analysis, transmission, storage of data in information and computer systems. ***Methods, techniques, technologies:*** methods and algorithms for fulfilling theoretical and applied problems of computer science; mathematical and computer modelling, 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 modelling 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.
Orientation of the educational programme	Educational and professional, fundamental, applied. General higher education of the second (master's) degree in the field of information technologies in speciality "Computer Science". The emphasis of the educational programme is on the training of specialists capable of fulfilling complex tasks of mathematical, informational and software support of computer systems in the field of information technologies.
Main focus of the educational programme	Special education in the field of information technologies with in-depth study of fundamental and applied methods of computer science related to modelling, design, development, software implementation and support of computer systems and technologies based on distributed systems and using intelligent mechanisms of presentation, processing and analysis of data and knowledge. Keywords: information technologies, computer design, data analysis technologies, cloud technologies, distributed systems, methods and models of presentation, processing and analysis of data and knowledge, intelligent systems, software.
Features of the programme	In-depth study of fundamental and applied computer science methods related to modelling, design, development, software implementation, and maintenance of computer systems and technologies based on distributed systems, as well as using intelligent mechanisms for presenting, processing, and analysing data and knowledge. The presence of a variable component of professionally oriented courses for computer science; practical training in research state institutions, enterprises and organisations

4 - SUITABILITY OF GRADUATES FOR EMPLOYMENT AND FURTHER EDUCATION	
Suitability for employment	Professional activity as a professional in the development of mathematical, information and software of computer systems, in the field of information technology, as well as administrator of distributed databases and systems. Graduates may be employed in occupations according to the National 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 2132.1 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 2321 Teachers of professional (vocational and technical) education institutions; 2322 Teachers of institutions of vocational pre-higher education.
Further education	Acquiring education according to the educational programme of the third (educational and scientific) cycle of higher education and obtaining additional qualifications in the adult education system.
5- TEACHING AND ASSESSMENT	
Teaching and training	Problem-based learning, self-study, learning through practical training. A balanced combination of classroom classes (lectures, laboratory classes, practical classes, self-study with information sources, consultations), distance learning and independent work based on problem-based, interactive and self-study learning.
Assessment	Ongoing assessment, written exams and defence of the final qualification work. Assessment is carried out in accordance with the "Regulations On the Assessment of Learning Outcomes of Students and Graduate Students in SUTE", "Regulations on the Organization of the Educational Process of Students"
6 – PROGRAMME COMPETENCES	
Integral competence (IC)	Ability to fulfil complex research tasks and/or innovation in the field of computer science.
General competencies (GC)	GC 1. Ability to think abstractly, analyze, and synthesize. GC 2. Ability to apply knowledge in practical situations. GC 3. Ability to communicate in the national language both orally and in written form regarding the subject area. GC 4. Ability to communicate in a foreign language. GC 5. Ability to learn and master modern knowledge. GC 6. Ability to be critical and self-critical. GC 7. Ability to generate new ideas (creativity).
Special (professional,	SK01. Understanding the theoretical basics of computer science.

subject) competences (SC)	SK02. 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 analyse formalized models of the subject area. SK04. Ability to collect and analyse data (including large data) to ensure the quality of project decision-making. SK05. Ability to develop, describe, analyse and optimize architectural solutions of information and computer systems for 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. Ability to develop and implement software projects, including their creation 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. 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. 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.
7 – PROGRAMME LEARNING OUTCOMES (PLO)	
	PLO1. Possess specialized conceptual knowledge that includes current scientific achievements in the field of computer science and is the basis for original thinking and conducting research, critical thinking of problems in the field of computer science and at the intersection of the fields of knowledge. PLO2. Possess specialized computer science problem-solving skills necessary for conducting research and/or conducting innovative activities to develop new knowledge and procedures. PLO3. Clearly and unambiguously convey one's own knowledge, conclusions and arguments in the field of computer science to specialists and non-specialists, in particular to persons who are studying. PLO4. Manage work processes in the field of information technologies, which are complex, unpredictable and require new strategic approaches. PLO5. Evaluate the results of teams and collectives in the field of information technologies, ensure the effectiveness of their activities. PLO6. Develop a conceptual model of an information or computer system. PLO7. Develop and apply mathematical methods for the analysis of information models. PLO8. Develop mathematical models and methods of data analysis (including large data). PLO9. Develop algorithmic and software for data analysis (including large data). PLO10. Design architectural solutions of information and computer systems for various purposes. PLO11. Create new algorithms for solving problems in the field of computer science, evaluate their effectiveness and limitations on their application. PLO12. Design and maintain databases and knowledge. PLO13. Assess and ensure the quality of information and computer systems for various purposes.

	PLO14. Test the software. PLO15. Identify the needs of potential customers regarding the automation of information processing. PLO16. Conduct research in the field of computer science. PLO17. Identify and eliminate problematic situations during software operation, formulate tasks for its modification or reengineering. PLO18. Collect, formalize, systematize and analyse the needs and requirements for the information or computer system being developed, operated or supported. PLO19. Analyse the current state and global trends in the development of computer sciences and information technologies.
8 – RESOURCE SUPPORT FOR PROGRAMME IMPLEMENTATION	
Staff	The implementation of the educational programme is provided by lecturers who have PhD and Doctor of Sciences degrees. The participation of foreign specialists and practitioners in the teaching of courses of the training cycle is possible.
Material and technical resources	The basis of material and technical resources are specialized computer laboratories with modern hardware and software resources that provide quality training for masters in the educational programme "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 SUTE, including in the multimedia library of SUTE, 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.
Information and Educational Resources	The regulations governing admission and academic procedures at SUTE are on the official website. Course summaries, course outlines, course syllabuses and assessment criteria for educational components are available on the university's distance learning platform.: - a system of distance learning MOODLE (provides independent and individual training, control), Office 365 tools and services, - free access to the Internet and e-mail; - information systems "MIA: Education", "Load-schedule", management of WEB-resources SUTE; - library fund management system - almost 1.5 million items of educational and scientific literature in the library of SUTE; - electronic document management system "OPTiMA - WorkFlow"; - corporate information environment in the form of a "personal account" of the user of the SUTE web portal. Ensuring publicity of information about educational programmes, degrees of higher education and qualification: implementation of SUTE's information policy, publication on the official website of SUTE of ECTS information packages, educational programmes, 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 SUTE employees, students (checking for plagiarism of all final qualifications, publications, publication of dissertation research on the official website of SUTE), 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 agreements and memorandums of cooperation between SUTE and other higher education institutions (research institutions) of Ukraine in accordance with the law.
International credit mobility	The university has signed cooperation agreements between SUTE and foreign higher education institutions, which provide for partnership exchanges and student training under international programmes and projects within the Erasmus+ programme.
Training of overseas students	Foreign students are guaranteed all rights and freedoms, in accordance with current legislation of Ukraine and the Statute of the University. Training of students is carried out on general terms with additional language training.

3.2. List of components of the educational programme and their logical sequence

3.2.1. List of educational programme components.

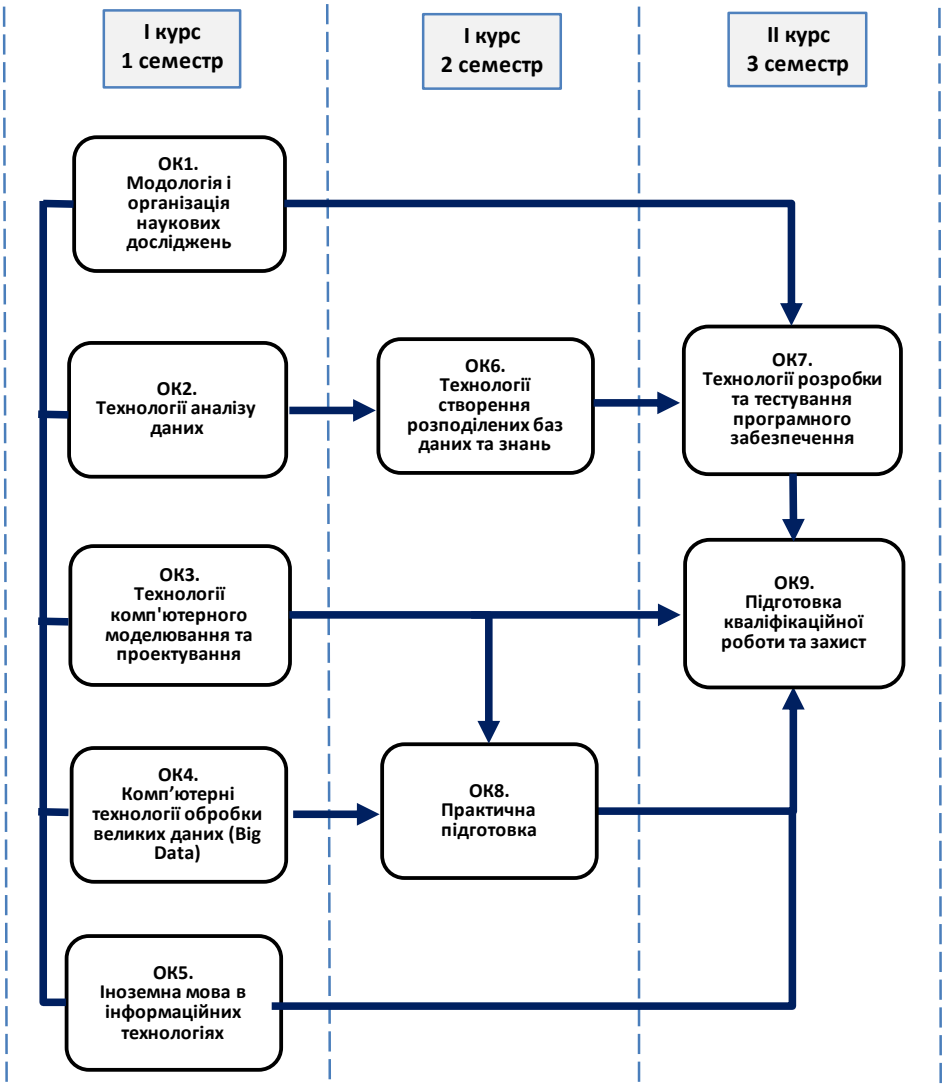
Code	Educational components of the programme	ECTS credits	Form of control
Compulsory components of EP (CC)			
CC 1	Methodology and organization of scientific research	6	Exam
CC 2	Technologies of data analysis	6	Exam
CC 3	Computer modelling and design technologies	6	Exam
CC 4	Computer technologies for processing big data (Big Data)	6	Exam
CC 5	Foreign language in information technologies	6	Exam
CC 6	Technologies for creating distributed databases and knowledge	7,5	Exam
CC 7	Software development and testing technologies	6	Exam
CC 8	Practical training	10,5	Credit test
CC 9	Preparation of qualification work and defence	12	Defence
Total Volume of Compulsory Components:		**66**	
Elective Components of EP (OC)			
OC 1	Educational component 1	6	Exam
OC 2	Educational component 2	6	Exam
OC 3	Educational component 3	6	Exam
OC 4	Educational component 4	6	Exam
Total Number of Elective Components:		**24**	
TOTAL VOLUME OF THE EDUCATIONAL PROGRAMME		**90,0**	

Students choose their elective courses through their personal account on the "MIA: Education" portal. Descriptions of the courses and their prerequisites are available in the SUTE Catalogue of Courses

3.3. Form of students' attestation

Attestation of master's degree students is carried out in the form of a public defence of graduation qualification papers. Graduation qualification papers should involve solving a complex task of research and/or innovative nature in the field of computer science. Graduation qualification papers should not contain academic plagiarism, falsification, or fabrication. Graduation qualification papers must be posted on the website or in the public repository of the higher education institution or its structural unit. Dissemination of final qualification papers containing information with restricted access should be carried out in accordance with the requirements of the legislation.

Structural and logical diagram of the educational programme



3.4. Matrix of correspondence of programme competences components of the educational programme

Components / Competences	EC 1	EC 2	EC 3	EC 4	EC 5	EC 6	EC 7	EC 8	EC 9
GC 1	•	•	•						•
GC 2	•	•	•	•		•	•	•	•
GC 3	•		•					•	•
GC 4					•				
GC 5	•	•		•		•	•	•	•
GC 6			•					•	•
GC 7	•	•	•					•	•
SC1	•								
SC 2	•		•					•	•
SC 3	•		•						•
SC 4	•	•		•					
SC 5			•					•	•
SC 6		•	•	•			•		•
SC 7			•	•		•	•	•	•
SC 8			•				•	•	
SC 9				•		•		•	
SC 10			•				•		
SC 11			•			•	•	•	•

3.5. Matrix for providing programme learning outcomes with relevant components of the educational programme

Components / Programme learning outcomes	EC 1	EC 2	EC 3	EC 4	EC 5	EC 6	EC 7	EC 8
PLO1	•							
PLO 2	•	•				•		
PLO 3	•							
PLO 4			•					•
PLO 5			•					
PLO 6	•		•					•
PLO 7	•		•					
PLO 8	•	•		•				
PLO 9		•		•				
PLO 10			•					•
PLO 11	•	•	•				•	•
PLO 12				•		•		•
PLO 13			•				•	•
PLO 14							•	
PLO 15			•				•	
PLO 16	•							
PLO 17							•	•
PLO 18			•				•	•
PLO 19	•				•			