3. Educational programme

Director of the Bachelor's degree programme – Desyatko Alyona Mykolayivna, PhD in Engineering, Associate Professor of the Department of software engineering and cyber security.

3.1. Profile of the educational programme "Software Product Projects Management", subject area 121 "Software engineering"

1 –General information	
Full name of the institution of higher education and structural subdivision	State University of Trade and Economics Faculty of Information Technologies Department of software engineering and cyber security
The degree of higher education / vocational pre-higher education and title of the qualification in the original language	Higher education degree – Master Subject area "Software Engineering"
The official name of the educational programme	"Software Product Projects Management "
Compliance with the standard of higher education of the Ministry of Education and Science of Ukraine	The programme corresponds to the Higher Education Standards of the Ministry of Education and Science of Ukraine
Type of diploma and volume of educational programme	Master's degree, single, 90 ECTS credits, study period 1 year 4 months
Availability of accreditation	-
Cycle / Level	NQF of Ukraine – the 7th level FQ for EHEA – the 2nd cycle EQF for LLL – the 7th level
Prerequisites	Individuals who have obtained a bachelor's degree can apply for the master's degree in specialty 121 "Software engineering" in the field of knowledge 12 "Information technologies". The programme of professional entrance examinations for persons who have obtained a previous level of higher education in other specialties should provide for verification of the person's acquisition of competencies and learning outcomes defined by the standard of higher education in the specialty 121 "Software Engineering" for the first (bachelor's) level of higher education.
Language (s) of teaching	Ukrainian
The duration of the educational programme	Until the full completion of the training period (1 year 4 months) or the next update of the programme

Internet address of the permanent placing of the educational programme	https://knute.edu.ua
2 –The purpose of the educational programme	
Formation of the personality of a specialist capable of solving complex non-standard tasks and problems of a research and innovation nature in the field of software engineering, who possess a system of knowledge in the field of software project management. Development of academic, professional and creative abilities of professionals who master modern achievements in the field of project management of software products and are able to solve complex professional tasks.	
3 - Characteristics of the educational programme	
Subject area description	*Object of study and activity:* processes of software development, modification, analysis, quality assurance, implementation and maintenance. *Training goals:* training of specialists who are able to solve complex tasks and problems in the development, quality assurance, implementation and support of software tools, which involves conducting research and/or implementing innovations and is characterized by the uncertainty of conditions and requirements. *Theoretical content of the subject area:* basic mathematical, infological, linguistic, economic conceptual provisions regarding the development and maintenance of software and ensuring its quality. *Methods, techniques and technologies:* methods of analysis and modeling of the application area, identification of information needs, classification and analysis of data for software design; methods of developing software requirements; methods of analysis and construction of software models; methods of software design, construction, integration, testing and verification; methods of modifying software components and data; reliability and quality models and methods in software engineering; software project management methods. *Tools and equipment:* software, hardware and cloud tools to support software engineering processes.
Orientation of the educational programme	The programme is focused on the educational, professional and applied direction of training The emphasis of the programme is on the formation of a specialist capable of solving professional tasks related to the management of software product development projects
The main focus of the educational programme	Higher education of the second (master's) level in the field of information technologies, specialty 121 "Software engineering" Educational and professional focus. Emphasis on the specialist's ability to carry out management, research and innovation activities in the real conditions of software development and software product project management *Keywords:* software product, project management, software product management, software product life cycle, programming, testing, protection of software products.

Peculiarities of the educational programme	Integration of professional training in the field of software engineering with innovative activities, focus on the development of software projects and on tools, methods of software product project management.
4 – Suitability of graduates for employment and further education	
Suitability of graduates for employment	Field of professional activity: development of software products, software development technologies and tools, software product project management, scientific research, expert and advisory activities in the field of software engineering. A specialist can hold primary positions (according to the Classifier of Professions of Ukraine DK 003:2010): 2132.2 (22481).
Further training	The possibility of continuing education at the third (educational and scientific) level of higher education. Acquisition of additional qualifications in the adult education system.
5 –Teaching and assessment	
Teaching and training	Student-centred learning, lectures, self-learning, learning through laboratory practice, problem-based, interactive, project-based, information-computer, self-developing, collective and integrative, contextual learning technologies
Assessment	Evaluation of students' educational achievements is carried out on the basis of: "Regulations on the organization of the educational process of students" "Regulations on evaluation of student and post-graduate students' learning results." Written exams, practical training, presentations, testing, defence of laboratory work, defence of individual projects, defence of qualification work.
6 –Programme competencies	
Integral competence	The ability of a person to solve complex tasks and problems in a certain field of professional activity or in the learning process, which involves conducting research and/or implementing innovations and is characterized by the uncertainty of conditions and requirements *that involve the application of software product project management methodologies.*
General Competences (GC)	GC01. The ability to abstract thinking, analysis and synthesis. GC02. The ability to communicate in a foreign language both orally and in writing. GC03. The ability to conduct research at an appropriate level. GC04. The ability to communicate with representatives of other professional groups of different levels (with experts of other fields of knowledge/types of economic activity). GC05. The ability to generate new ideas (creativity

Special (professional, subject) competences (SC)	SC01. The ability to analyze subject areas, form, classify software requirements. SC02. The ability to develop and implement scientific and/or applied projects in the field of software engineering. SC03. The ability to design the architecture of the software / *software product*, to model the functioning processes of individual subsystems and modules. SC04. The ability to develop and implement new competitive ideas in software engineering. SC05. The ability to develop, analyze and apply specifications, standards, rules and recommendations in the field of software engineering. SC06. The ability to effectively manage financial, human, technical and other project resources in the field of software engineering. SC07. The ability to think critically about problems in the field of information technology and at the boundaries of fields of knowledge, integrate relevant knowledge and solve complex problems in broad or multidisciplinary contexts. SC08. The ability to develop and coordinate processes, stages and iterations of the software/*software product* life cycle based on the application of modern software/software development models, methods and technologies. SC09. The ability to ensure the quality of the software / *software product*. *SC10. The ability to use software project management approaches that will be used throughout the project.* *SC11. The ability to use project management industry standards that focus on the business case for software product projects.*
7 –Programme learning outcomes	
	LO01. To know and apply modern professional standards and other regulatory and legal documents on software engineering LO02. To evaluate and choose effective methods and models of software development, implementation, maintenance and management of relevant processes at all stages of the life cycle. LO03. To build and research models of information processes in the applied field. LO04. To identify information needs and classify data for software design. LO05. To develop, analyze, justify and systematize software requirements. LO06. To develop and evaluate software design strategies; substantiate, analyze and evaluate options for project solutions from the point of view of the quality of the final software product, resource limitations and other factors. LO07. To analyze, evaluate and apply modern software and hardware platforms at the system level to solve complex software engineering problems. LO08. To develop and modify software architecture to meet customer requirements.

	LO09. To reasonably choose programming paradigms and languages for software development; apply modern means of software development in practice. LO10. To modify existing and develop new algorithmic solutions for detailed software design. LO11. To ensure quality at all stages of the software life cycle, including using relevant models and evaluation methods, as well as means of automated software testing and verification. LO12. To make effective organizational and management decisions in conditions of uncertainty and changing requirements, compare alternatives, assess risks. LO13. To configure software, manage its changes and development of software documentation at all stages of the life cycle. LO14. To forecast the development of software systems and information technologies. LO15. To reengineer the software in accordance with the customer's requirements. LO16 . To plan, organize and carry out software testing, verification and validation. LO17. To collect, analyze, evaluate the information necessary for solving scientific and applied problems, using scientific and technical literature, databases and other sources. *LO18. To know the framework structure and methods of construction and application of the software product management system* *LO19. To be able to choose and automatically configure software product management technology according to the life cycle of the software product.* *LO 20. To be able to coordinate various projects in the software project management system*
8 –Resource support for the implementation of the programme	
Personnel support	Scientific and pedagogical workers with scientific degrees and/or scientific titles, as well as highly qualified specialists and practitioners are involved in the implementation of the programme
Material and technical support	The use of laboratories, computer and specialized classrooms, library and infrastructure of DTEU as a whole
Information and educational and methodical support	The single digital space of the University combines all departments that are aimed at shaping the individual trajectory of a student of higher education The active MOODLE distance learning system and the MS 365 environment ensure independent and individual work of students.
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 through the conclusion of agreements on international academic mobility (Erasmus+), on double graduation, on long-term international projects that involve student training, the issuance of a double diploma, etc.
Teaching foreign students	It is provided – subject to the mandatory knowledge of the Ukrainian language at a level not lower than B1.

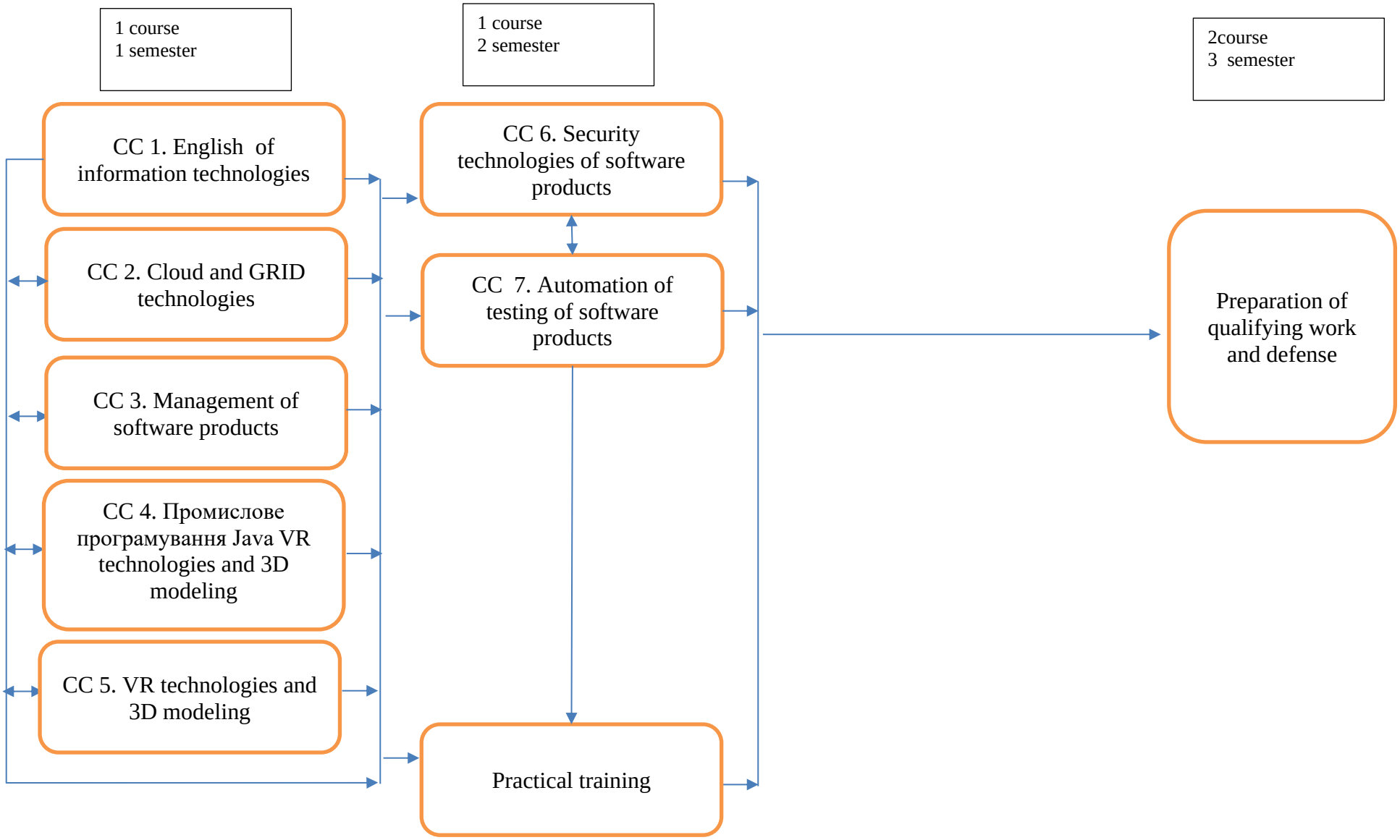
2. The list of components of the educational programme and their logical consistency

2.1. List of EP components

Code N / A	Components of the educational programme (educational subjects, course projects (works), practices, qualification exam, graduation qualification work)	Amount of credits
1	2	3
Compulsory components of the EP		
CC 1.	English of information technologies	6
CC 2.	Cloud and GRID technologies	6
CC 3.	Management of software products	6
CC 4.	Java industrial programmeming	6
CC 5.	VR technologies and 3D modeling	6
CC 6.	Security technologies of software products	6
CC 7.	Automation of testing of software products	7,5
Total volume of compulsory components:		**43,5**
Elective components of the EP		
EC 1	Architecture and programming technologies of mobile applications	6
EC 2.	Administration and protection of data warehouses	6
EC 3	Safety of life	6
EC 4.	Biometric authentication technologies in information systems	6
EC 5.	Protection of electronic communications systems	6
EC 6.	Intellectual Property	6
EC 7.	Information technologies in the system of ensuring economic security of the state	6
EC 8	Information wars	6
EC 9.	IT law	6
EC 10.	Methods and means of information protection in computer systems	6
EC 11.	Fundamentals of cyber security	6
EC 12.	Programmeming and administration of the information system of the enterprise	6
EC 13.	Design of multimedia systems	6
EC 14.	Psychology of adaptation	6
EC 15.	Психологія бізнесу Business psychology	6
EC 16.	Technologies of WPF applications	6
EC 17.	Security technologies of Web resources	6
EC 18.	Technologies of data analysis	6
EC 19.	Design technologies of information systems	6
EC 20.	Philosophy of personality	6
EC 21.	Functional and logical programmeming	6
The total amount of elective components:		**24**
Practical training		
Practical training		**10,5**
Attestation		
Preparation of the final qualification work and its defence		**12**
TOTAL VOLUME OF EDUCATIONAL PROGRAMME		**90**

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

2.2. Structural and logical scheme of the EP



3. Form of attestation of applicants of higher education

The attestation is carried out in the form of public defense of a qualification work.

The qualification work must solve a complex software engineering problem or a problem and involve research and/or innovation.

The qualification work should not contain academic plagiarism, fabrication or falsification. The qualification work must be published on the official website of the institution of higher education or its division, or in the repository of the institution of higher education.

The publication of qualification works with limited access is carried out in accordance with the requirements of the law.

4.1. Matrix of compliance of programme competencies to the compulsory components of the educational programme

Components / Competences	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7
GC01		+	+	+	+	+	+
GC02	+	+		+	+	+	+
GC03	+	+	+		+	+	+
GC04	+	+	+				
GC05		+	+		+		+
SC01			+		+		
SC02		+	+	+	+		+
SC03			+	+	+		
SC04	+	+	+	+	+	+	
SC05		+	+				
SC06	+		+				
SC07	+	+			+	+	+
SC08			+		+		+
SC09	+		+	+	+		+
SC10			+			+	
SC11			+				

4.2. Matrix of correspondence of programme competences elective 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	EC 10	EC 11	EC 12	EC 13	EC 14	EC 15	EC 16	EC 17	EC 18	EC 19	EC 20	EC 21
GC01	+	+	+	+	+	+	+	+	+	+	+	+	+			+	+	+	+		+
GC02	+						+					+	+			+	+				
GC03				+		+	+											+	+		+
GC04		+							+				+	+	+	+			+	+	
GC05	+		+	+				+	+		+		+	+	+				+	+	+
SC01	+			+								+	+			+		+	+		+
SC02	+			+	+					+								+	+		
SC03	+				+							+							+		
SC04	+								+			+	+			+			+		
SC05	+											+					+		+		
SC06				+					+							+			+		
SC07			+				+	+			+		+					+	+		+
SC08		+																+	+		+
SC09	+	+		+												+	+				+
SC10																					
SC11																					

5.1. Matrix of provision of programme learning outcomes corresponding compulsory components of the educational programme

Components / Programme learning outcomes	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7
LO01		+	+				+
LO02			+	+			+
LO03	+		+				
LO04	+		+				
LO05		+	+	+	+		
LO06			+				
LO07		+	+			+	
LO08		+			+		
LO09			+	+			
LO10		+		+	+		
LO11			+		+		+
LO12	+		+			+	
LO13				+			
LO14	+	+	+				
LO15				+			
LO16					+	+	+
LO17			+				
LO18			+				
LO19			+			+	
LO20			+				

5.2. Matrix of provision of programme learning outcomes corresponding elective components of the educational programme

Components / Learning outcomes	EC 1	EC 2	EC 3	EC 4	EC 5	EC 6	EC 7	EC 8	EC 9	EC 10	EC 11	EC 12	EC 13	EC 14	EC 15	EC 16	EC 17	EC 18	EC 19	EC 20	EC 21
LO01	+	+		+	+	+			+	+		+	+			+	+	+	+		+
LO02	+			+						+		+	+			+		+	+		+
LO03							+			+		+	+					+			+
LO04	+			+								+	+			+	+	+	+		+
LO05			+					+		+	+	+					+				+
LO06													+								+
LO07		+										+	+								+
LO08		+										+	+				+				+
LO09	+															+			+		
LO10	+															+			+		
LO11	+											+	+			+			+		+
LO12					+							+						+			+
LO13	+								+										+		+
LO14				+								+						+			+
LO15	+															+			+		+
LO16									+							+					+
LO17		+	+	+	+	+		+	+	+	+	+	+	+	+			+		+	+
LO18																					
LO19																					
LO20																					