MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

KYIV NATIONAL UNIVERSITY OF TECHNOLOGIES AND DESIGN

APPROVED BY THE ACADEMIC COUNCIL
Chairman of the Academic Council KNUTD

_____ Ivan GRYSHCHENKO

(minutes «____» _____ 2021 №_ __)

EDUCATIONAL-PROFESSIONAL PROGRAM
COMPUTER ENGINEERING

Level of higher education Second

Degree of higher education Master

Knowledge area 12 Information technology

Specialty 123 Computer engineering

Qualification Master in Computer engineering

Kyiv 2021

1. Profile of the educational-professional program "Computer engineering"

1 – General information	
Full names of the higher education institution and structural unit	Kyiv National University of Technologies and Design, Department of Computer engineering and electromechanics.
Degree of higher education and qualification	Level of higher education - second. Degree of higher education - master. Knowledge area - 12 Information technology. Specialty - 123 Computer engineering.
Diploma and the scope	Master`s Diploma, unitary, 90 credits ECTS.
Accreditation	–
Cycle/level	The seventh level according to National Qualifications Framework.
Prerequisites	Bachelor's degree.
Language	Ukrainian.
The validity of the study program	_
Weblink to the study program description	http://en.knutd.edu.ua/ekts/
2 – The purpose of the study program	
Training of specialists with deep knowledge, as well as basic and professional competencies in the field of computer engineering, aimed at acquiring the student's knowledge, skills and abilities necessary for employment, and ensuring his ability to work professionally. The main objectives of the program are to train professionals capable of solving complex research and innovation problems in the field of computer engineering; formation and development of general and professional competencies in the field of computer engineering, aimed at obtaining software learning outcomes necessary for research, design, production, use and maintenance of computer systems and networks.	
3 – Characteristics of the study program	
Subject area	The program is focused on the formation of applicants for competencies to acquire deep knowledge, skills and abilities in the specialty. Compulsory educational components - 73%, of which: disciplines of general training - 4.5%, vocational training - 36%, practical training - 23%, learning a foreign language - 4.5%, diploma design - 32%. Disciplines of free choice of students - 27% are selected from the university catalog in accordance with the approved University procedure.
Program orientation	Educational-professional for master's degree preparation.
The main focus of the program	Emphasis is placed on the formation and development of professional competencies in the field of computer engineering; study of theoretical and methodological provisions, organizational and practical tools for research, design, production, use and maintenance of computer systems and networks.
Study program features	The educational and professional program develops theoretical and practical training in the field of design, creation and maintenance of computer systems and networks, as well as the introduction of innovative information technologies in the domestic sphere.
4 – Graduate's suitability for employment and further study	
The employment suitability	The graduate is suitable for employment in enterprises, organizations and institutions operating in the field of computer engineering and computer systems and networks. Professional job titles that can be performed by the applicant: information technology specialist, software development and testing specialist, computer software development specialist, system administration technician,

	configured computer system technician, structured cabling system technician, technician computer (information and computing) center.	
Further study	Graduates have the right to continue their education at the third (educational and scientific) level of higher education and to acquire additional qualifications in the system of adult education.	
5 – Teaching and grading		
Teaching and learning	Student-centered and problem-oriented learning, learning through educational, industrial, undergraduate practice and self-study are used. The system of teaching methods is based on the principles of purposefulness, binary - active direct participation of research and teaching staff and applicants for higher education. Forms of organization of the educational process: lecture, seminar, practical, laboratory classes, practical training, independent work, consultation, development of professional projects (works).	
Grading	Testing of knowledge, presentations, reports on laboratory works, reports on practice, control works, course (project) works, tests, examinations, public defense of qualifying work.	
6 – Program competencies		
Integral competence **(IC)**	Ability to solve complex problems and problems in the field of computer engineering 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 adapt and act in a new situation.
	GC 2	Ability to abstract thinking, analysis and synthesis.
	GC 3	Ability to conduct research at the appropriate level.
	GC 4	Ability to search process and analyze information from various sources.
	GC 5	Ability to generate new ideas (creativity).
	GC 6	Ability to identify, pose and solve problems.
	GC 7	Ability to make informed decisions.
	GC 8	Ability to communicate in a foreign language.
Professional competencies (**PC)**	**PC 1**	Ability to determine the technical characteristics, design features, application and operation of software, software and hardware, computer systems and networks for various purposes.
	PC 2	Ability to develop algorithmic and software, components of computer systems and networks, Internet applications, cyberphysical systems using modern methods and programming languages, as well as tools and systems for design automation.
	PC 3	Ability to design computer systems and networks with goals, constraints, technical, economic and legal aspects in mind.
	PC 4	Ability to build and research models of computer systems and networks.
	PC 5	Ability to build architecture and create system and application software for computer systems and networks.
	PC 6	Ability to use and implement new technologies, including smart, mobile, green and secure computing technologies, to participate in the modernization and reconstruction of computer systems and networks, various embedded and distributed applications, in particular to increase their efficiency.
	PC 7	Ability to research, develop and select technologies for creating large and ultra-large systems.
	PC 8	Ability to ensure the quality of information technology products and services throughout their life cycle.

	PC 9	Ability to present the results of own research and / or development in the form of presentations, scientific and technical reports, articles and reports at scientific and technical conferences.
	PC 10	Ability to identify, classify and describe the operation of software and hardware, computer systems, networks and their components.
	PC 11	Ability to choose effective methods for solving complex problems of computer engineering, critically evaluate the results and justify decisions.
7 – Program learning outcomes		
Knowledge and understanding:		
PLO 1	Know the concepts, concepts, principles of research, design, production, use and maintenance of computers and computer systems, computer networks, cyberphysical systems, the Internet of Things, IT infrastructures.	
Skills:		
PLO 2	Apply general approaches to cognition, methods of mathematics, natural and engineering sciences to solve complex problems of computer engineering.	
PLO 3	Find the necessary data, analyze and evaluate them.	
PLO 4	Build and research models of computer systems and networks, assess their adequacy, determine the limits of applicability.	
PLO 5	Apply specialized conceptual knowledge, including modern scientific achievements in the field of computer engineering, necessary for professional activities, original thinking and research, critical thinking of information technology problems and at the boundaries of knowledge	
PLO 6	Develop and implement projects in the field of computer engineering and related interdisciplinary projects, taking into account engineering, social, economic, legal and other aspects.	
PLO 7	Analyze issues, identify and formulate specific problems that need to be solved, choose effective methods to solve them.	
PLO 8	Solve problems of analysis and synthesis of computer systems and networks.	
PLO 9	Apply knowledge of technical characteristics, design features, purpose and rules of operation of software and hardware of computer systems and networks to solve complex problems of computer engineering and related problems.	
PLO 10	Develop software for embedded and distributed applications, mobile and hybrid systems.	
PLO 11	Develop and implement computer control systems.	
PLO 12	Analyze and improve computer control systems.	
Forming reasoning:		
PLO 13	Search for information in various sources to solve problems of computer engineering, analyze and evaluate this information.	
PLO 14	Make effective decisions on the development, implementation and operation of computer systems and networks, analyze alternatives, assess the risks and likely consequences of decisions.	
PLO 15	Fluently communicate orally and in writing in Ukrainian and one of the foreign languages (English, German, Italian, French, Spanish) when discussing professional issues, research and innovation in the field of information technology.	
PLO 16	Clearly and unambiguously convey one's knowledge, conclusions and arguments on information technology issues and related intersectoral issues to specialists and non-specialists, in particular to students.	
8 – Resources for program implementation		
Staffing	All teaching staff who provide this scientific study program correspond to the taught courses profile by qualification and have got the necessary experience of pedagogical activity and practical work. High professionals with experience	

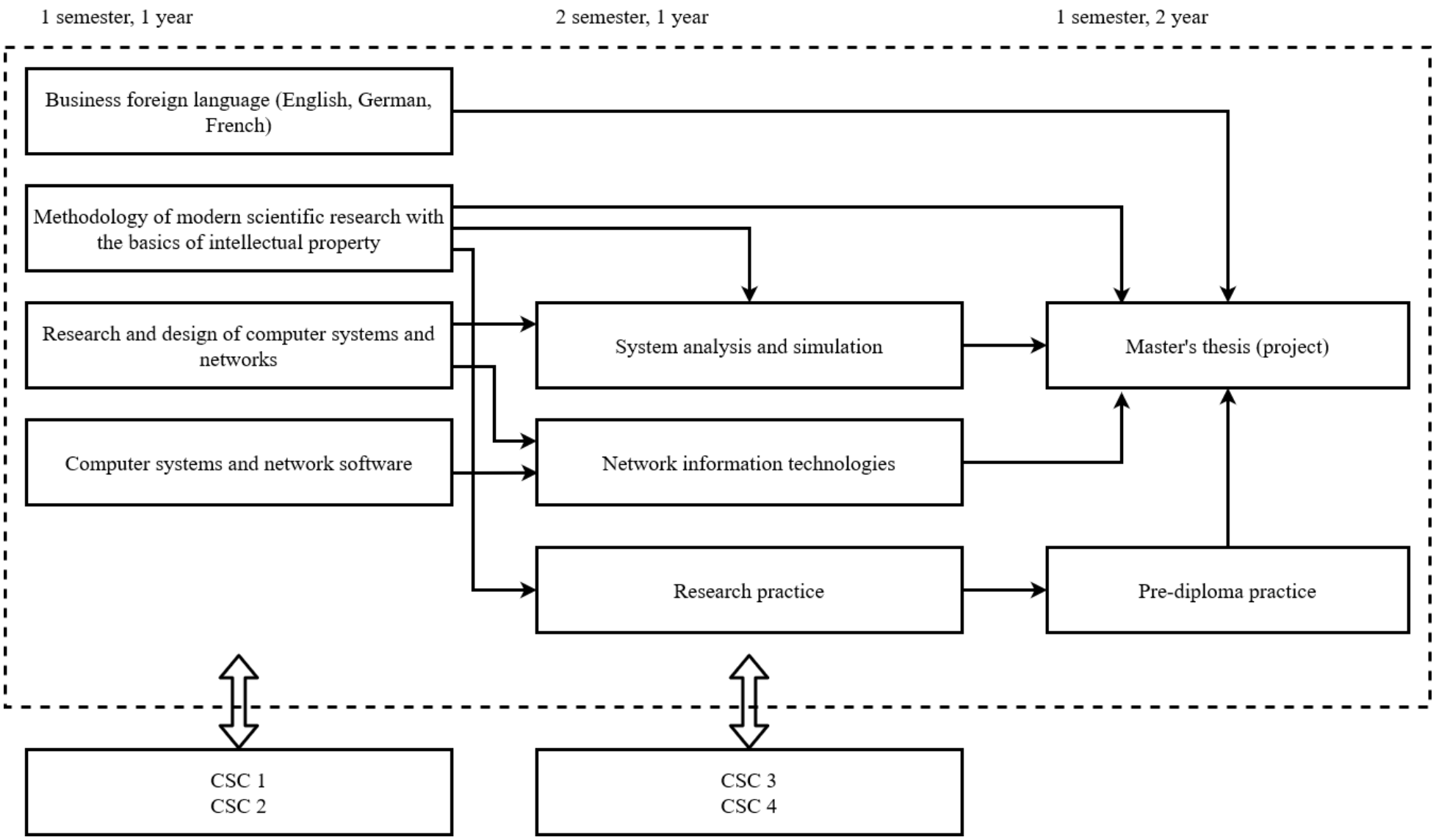
	in research / management / innovation / creative work in the consumer industry field are involved in the training.
Logistics	Logistics allows to fully ensure the educational process throughout the study program cycle. The condition of the classes and laboratories is certified with sanitary and technical passports that comply with existing regulations.
Information and methodical support	The program is fully provided with an educational and methodical complex of all courses, which availability is presented in the modular environment of the educational process of the University.
9 – Academic mobility	
National credit mobility	The program provides the possibility for academic mobility in some components provided the acquisition of general and / or professional competencies.
International credit mobility	The program develops prospects for internships and participation in research projects and academic mobility programs abroad.
Studying for foreign students	Studying of foreign students is according to accredited programs.

2. The list of components of the educational program and their logical sequence

2.1. List of components of the educational-professional program

Code	Components of the study program (study courses, courses projects (works), practices, qualification work)	Number of credits	Form of control
1	2	3	4
Compulsory components			
General courses cycle			
CC 1	Business Foreign Language (english, german, france)	3	credit
CC 2	Methodology of modern scientific studies with the basics of intellectual property	3	exam
	Total for the cycle	6	
Professional courses cycle			
CC 3	Research and design of computer systems and networks	6	exam
CC 4	Computer systems and network software	6	exam
CC 5	System analysis and simulation	6	exam
CC 6	Network information technologies	6	exam
CC 7	Research practice	6	credit
CC 8	Pre-diploma practice	9	credit
CC 9	Master's thesis (project)	21	attestation
	Total for the cycle	60	
	Total credits for Compulsory components	**66**	
Elective components			
CSC	Courses for student`s choice	24	credit
	Total credits for Elective components	**24**	
	TOTAL CREDITS	**90**	

2.2. Structural and logical scheme of the educational and professional program Computer Engineering majoring in speciality123 Computer Engineering



3. Attestation

Form of attestation	Attestation of a graduate of an educational program is carried out in the form of public defense of a master's thesis (project).
Document of higher education	Master's degree with a qualification: Master of Computer Engineering.

4. Matrix of correspondence of program competences to components of the educational-professional program "Computer Engineering"

	GC 1	GC 2	GC 3	GC 4	GC 5	GC 6	GC 7	GC 8	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6	PC 7	PC 8	PC 9	PC 10	PC 11
CC1	+	+	+	+	+	+	+	+									+		
CC2	+		+	+	+	+	+	+									+		
CC3			+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+
CC4									+	+	+	+	+	+				+	+
CC5	+	+		+				+			+	+			+	+		+	
CC6					+				+	+			+	+	+	+			+
CC7	+	+	+									+			+		+		+
CC8	+	+	+	+					+	+							+		+
CC9		+	+		+	+	+		+	+	+						+		+

5. Matrix for providing software learning outcomes with relevant components of the educational-professional program "Computer Engineering"

	PLO 1	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
CC1		+	+				+						+			+
CC2			+										+		+	+
CC3	+	+		+	+	+	+	+	+	+	+	+		+	+	+
CC4	+			+	+			+	+	+	+			+		
CC5	+	+	+	+		+	+	+				+	+			
CC6	+				+	+			+	+	+	+		+	+	
CC7	+		+	+			+			+			+	+	+	
CC8		+			+	+		+	+		+	+	+			+
CC9	+	+		+	+	+		+	+	+	+	+		+		+