MINISTRY OF EDUCATION AND SCIENCE OF UKRAUINE

KYIV NATIONAL UNIVERSITY OF TECHNOLOGIES AND DESIGN

EDUCATIONAL PROFESSIONAL PROGRAM

COMPUTER ENGINEERING

Level of higher education first (Bachelor's)

Degree of higher education Bachelor

Field of knowledge 12 Information Technologies

Specialty 123 Computer Engineering

Qualification Bachelor in Computer Engineering

Kyiv 2021

1. Profile of Educational Professional Program

Computer Engineering

1 – General Information	
Full name of higher educational institution and structural unit	Kyiv National University of Technologies and Design. Department of Information and Computer Technologies and Sciences.
Degree of higher education and qualification in the original language	Level of higher education - first-cycle degree (Bachelor). Degree of higher education – Bachelor. Field of knowledge – 12 Information technologies. Specialty – 123 Computer engineering.
Type of diploma and scope of the program	Bachelor's diploma, single, 240 ECTS credits / Bachelor's diploma, single, 180 ECTS credits (for reduced period of study)
Accreditation	Certificate НД-ІІ № 2484682 of 03.07.2017 valid till 01.07.2027.
Cycle/ level	National Qualifications Framework of Ukraine: Bachelor- level 6.
Prerequisites	Complete general secondary education, degree of junior bachelor (junior specialist). In accordance with the Standard of Higher Education in the specialty based on the degree of junior bachelor (OQR of the junior specialist), the University recognizes and recalculates ECTS credits received within the previous educational program of junior bachelor (junior specialist).
Language(s) of instruction	Ukrainian.
The validity of educational program	Till 01.07.2027.
Internet address of permanent location of educational program description	http://knutd.edu.ua/ekts/
2 – The purpose of educational program	
Training of specialists with deep knowledge as well as basic and professional competencies in the field of computer engineering, aimed at obtaining of knowledge and skills necessary for employment and ensuring the ability to work. The main objectives of the program are training of specialists who are able to use and implement computer engineering technologies independently; formation and development of general and professional competencies in the field of computer engineering, aimed at obtaining knowledge and skills necessary for the design, creation and maintenance of computer systems and networks.	
3 – Characteristics of the program	
Subject area	The program is focused on the formation of higher education applicants' competencies to acquire in-depth knowledge and skills in the specialty. Compulsory educational components - 75%, of which: general training disciplines - 30%, vocational training - 44%, practical training - 13%, learning a foreign language - 13%. Disciplines of free choice of students – 25% are selected from the University catalog in accordance with the approved

	procedure of the University.	
Orientation of the educational program	Educational and professional training for bachelor's degree.	
The main focus of the program	The emphasis is on the formation and development of professional competencies in the field of computer engineering; the study of theoretical and methodological provisions, organizational and practical tools for designing, creating and maintaining computer systems and networks.	
Features of the educational program	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 household sphere.	
4 – The suitability of graduates for employment and further training		
Employability	The graduate is suitable for employment in enterprises, organizations and institutions operating in the field of computer engineering and computer systems and networks. The following positions can be held: information technology specialist, software development and testing specialist, computer program development specialist, system administration technician, configured computer system technician, structured cabling system technician, computer (information and computing) center technician.	
Further training	Graduates have the possibikity to continue their education at the second (master) level of higher education.	
5 – Teaching and assessment		
Teaching and learning	Student-centered and problem-oriented learning, practiced-based learning and self-study are used. The system of teaching methods is based on the principles of purposefulness, binary - active direct participation of a scientific and pedagogical worker and an applicant for higher education. Teaching is carried out in the form of lectures, seminars, practical, laboratory classes, independent work and development of professional projects (works).	
Assessment	Tests, presentations, laboratory work reports, practicum reports, project works, credits and examinations.	
6 – Program competencies		
Integral competence (IC)	Ability to solve complex problems, practical problems and problems in the field of computer engineering or in the learning process, which involves the application of theories and methods of computer engineering and is characterized by the complexity and uncertainty of conditions and requirements.	
General competencies (GC)	GC 1	Ability to abstract thinking, analysis and synthesis.
	GC 2	Ability to learn and acquire modern knowledge.
	GC 3	Ability to apply knowledge in practical situations.
	GC 4	Ability to communicate in the state language both orally and in writing.

	GC 5	Ability to communicate in foreign language.
	GC 6	Interpersonal skills.
	GC 7	Ability to identify, set and solve problems.
	GC 8	Ability to work in a team.
	GC 9	The ability to exercise their rights and responsibilities as a member of the society, to realize the values of civil (free democratic) society and the need for its sustainable development, the rule of law, human and civil rights and freedoms in Ukraine.
	GC 10	Ability to preserve and multiply moral, cultural, scientific values and achievements of society on the basis of understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society and technology, to use various types and forms of physical activity for outdoor activities and healthy lifestyle.
Professional competencies (PC)	PC 1	Ability to apply the legal and regulatory framework, as well as national and international requirements, practices and standards in order to carry out professional activity in the field of computer engineering.
	PC 2	Ability to use modern methods and programming languages for algorithmic and software development.
	PC 3	Ability to create system and application software for computer systems and networks.
	PC 4	Ability to ensure the protection of information processed in computer and cyber-physical systems and networks in order to implement the established information security policy.
	PC 5	Ability to use design automation tools and systems to develop components of computer systems and networks, Internet applications, cyber-physical systems, etc.
	PC 6	Ability to design, implement and maintain computer systems and networks of various types and purposes.
	PC 7	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 8	Willingness to participate in the implementation of computer systems and networks, their commissioning at the facilities for various purposes.
	ФК 9	Ability to administer, use, adapt and operate existing information technologies and systems.
	PC 10	Ability to organize workplaces, their technical equipment, placement of computer equipment, use of organizational, technical, algorithmic and other methods and means of information protection.
	PC 11	Ability to arrange the obtained work results in the form of presentations, scientific and technical reports.
	PC 12	Ability to identify, classify and describe the work of software and hardware, computer and cyber-physical systems, networks and their components using analytical methods and modeling methods.
	PC 13	Ability to solve problems in the field of computer and information technologies, to determine the limitations of these technologies.

	PC 14	Ability to design systems and their components taking into account all aspects of their life cycle and objectives, including the creation, configuration, operation, maintenance and disposal.
	PC 15	Ability to justify the choice of methods for solving specialized problems, critically evaluate the results, justify and defend the decisions made.
	PC 16	Ability to use and implement innovative information technologies and systems.
7 – Program learning outcomes		
Knowledge and understanding:		
PLO 1	Know and understand the scientific principles underlying the operation of computer hardware, systems and networks.	
PLO 2	Have skills in experimentation, data collection and modeling in computer systems.	
PLO 3	Know the latest technologies in the field of computer engineering.	
PLO 4	Know and understand the impact of technical solutions in the public, economic, social and environmental context.	
PLO 5	Have basic knowledge of economics and project management.	
PLO 6	Have knowledge in the field of innovative information technologies and systems.	
Application of knowledge and understanding (skills):		
PLO 7	Be able to apply knowledge to identify, formulate and solve technical problems of the specialty, using the methods that are most suitable for achieving the goals.	
PLO 8	Be able to solve problems of analysis and synthesis of means specific to the specialty.	
PLO 9	Be able to think in a consistent manner and apply creative abilities to form new ideas.	
PLO 10	Be able to apply knowledge of technical characteristics, design features, purpose and rules of operation of software and hardware of computer systems and networks to solve technical problems of the specialty.	
PLO 11	Be able to develop software for embedded and distributed applications, mobile and hybrid systems, calculate and operate equipment typical for the specialty.	
PLO 12	Be able to search for information in various sources to solve problems of computer engineering.	
PLO 13	Be able to work effectively both individually and in a team.	
PLO 14	Be able to identify, classify and describe the operation of computer systems and their components.	
PLO 15	Be able to combine theory and practice, as well as make decisions and develop a strategy for solving problems of the specialty, taking into account universal values, social, state and industrial interests.	
PLO 16	Be able to carry out experimental research on professional topics.	
PLO 17	Be able to apply knowledge in the field of innovative information technologies and systems to solve practical problems.	
Formation of judgements:		
PLO 18	Be able to assess the results obtained and reasonably defend the decisions made.	
PLO 19	Communicate orally and in writing on professional issues in Ukrainian and in one of the foreign languages (English, German, French, Spanish).	
PLO 20	Use information technology for effective communication at the professional and social levels.	
PLO 21	Ability to adapt to new situations, justify, make and implement decisions within its competence.	
PLO 22	Realize the need for lifelong learning in order to extend the acquired knowledge and acquire new professional knowledge and improve creative thinking.	
PLO 23	Perform work qualitatively and achieve the set goal in compliance with the requirements of professional ethics.	

8 – Resource support for program implementation	
Staffing	All scientific and pedagogical workers who provide the educational program on qualification, correspond to a profile and the direction of the educational components which are taught; have the necessary experience of pedagogical work and experience of practical work. In the process of organizing training professionals with experience in research / management / innovation / creative work and / or work in the specialty are involved.
Logistics support	Logistics allows to fully ensure the educational process throughout the training cycle of the educational program. The condition of the premises is certified by sanitary and technical passports that comply with current regulations.
Information and educational and methodical support	The program is fully provided with an educational and methodological complex of all the components of the educational program, the presence of which is presented in the modular environment of the educational process of the University.
9 – Academic mobility	
National credit mobility	Provides for the possibility of academic mobility in some components of the educational program, ensuring the acquisition of general and / or professional competencies.
International credit mobility	The program develops prospects for participation and internships in research projects and academic mobility programs abroad.
Training of foreign seekers of higher education	Training of foreign applicants for higher education is carried out according to accredited educational programs.

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

2.1 The list of components of the educational-vocational program of the first (Bachelor's) level of higher education

Code	Components of the study program (study courses, course projects (works), practical training, qualification work)	Number of credits	Form of control
1	2	3	4
Compulsory components			
General courses cycle			
CC 1	Ukrainian and Foreign Culture	3	credit
CC 2	Foreign Language	12	exam
CC 3	Ukrainian Language for Business Communication	3	credit
CC 4	Philosophy, Political Studies and Social Studies	6	exam
CC 5	Foreign Language (for specific purposes)	12	exam
CC 6	Life safety and Civil Protection	3	exam
CC 7	Physical Training	3/9*	credit
CC 8	Higher Mathematics	12	exam
CC 9	Physics	6	exam
CC 10	Discrete Mathematics	6	exam
CC 11	Theory of Probability and Mathematic Statistics	3	exam
CC 12	Algorithms and Computation Techniques	3	exam
	Total for the cycle	72	
Vocational courses cycle			

CC 13	Information Systems and Technologies	3	exam
CC 14	Basics of Programming	6	exam
CC 15	Object-oriented Programming	3	exam
CC 16	Computer Logic	6	exam
CC 17	Computer Architecture	6	exam
CC 18	Computer Electronics	3	exam
CC 19	Computer Circuitry	3	exam
CC 20	System Programming	3	exam
CC 21	Information Security in Computer Systems	3	exam
CC 22	Data Base and Software Engineering	6	exam
CC 23	Digital Signal Processing	3	credit
CC 24	Computer Networks	3	exam
CC 25	Hardware Designing	3	credit
CC 26	Network software	3	exam
CC 27	Decision Support Systems	3	exam
CC 28	System Software	3	exam
CC 29	Parallel Computing in Computer Systems	6	exam
CC 30	Computer System Design Technologies	6	exam
CC 31	Training Practicum	12	credit
CC 32	Field Practicum	6	credit
CC 33	Pre Diploma Practicum	6	credit
CC 34	Bachelor's Diploma Thesis	12	certification
	Total for the cycle	108	
	Total credits for compulsory components	180	
Elective components			
CSC	Courses for student's choice	60	credit
	Total credits	240	

* – non-credit discipline 2,3,4 semesters.