

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE  
KYIV NATIONAL UNIVERSITY OF TECHNOLOGIES AND DESIGN

EDUCATIONALSCIENTIFIC PROGRAM  
CHEMICAL TECHNOLOGY AND ENGINEERING

Level of higher education – third (educational and scientific)

Degree of higher education – Doctor of Philosophy

Knowledge area – 16 Chemical technology and bioengineering

Specialty – 161 Chemical technologies and engineering

Qualification – Doctor of Philosophy of Chemical technologies and engineering

Kyiv 2021

1. 1. Profile of the educational scientific program  
CHEMICAL TECHNOLOGY AND ENGINEERING

<b>1 – General information</b>	
Full names of the higher education institution and structural unit	Kyiv National University of Technologies and Design. Department of Applied Ecology, Technology of Polymers and Chemical Fibers. Department of Electrochemical Power Engineering & Chemistry.
Degree of higher education and qualification	Level of higher education - third (educational and scientific). Degree of higher education - Doctor of Philosophy. Knowledge area – 16 Chemical technology and bioengineering. Specialty - 161 Chemical technologies and engineering.
Diploma and the scope	PhD degree, single, 48 ECTS credits.
Accreditation	–
Cycle / level	National Qualifications Framework of Ukraine is the eighth level.
Prerequisites	Master’s degree or educational qualification level of a specialist.
Language	Ukrainian
The validity of the study program	–
Web link to the study program description	<a href="https://en.knutd.edu.ua/ects/">https://en.knutd.edu.ua/ects/</a>
<b>2 – The purpose of the educational program</b>	
<p>The purpose of the educational and scientific program is to train specialists who have deep knowledge and professional competencies in the field of chemical technology and engineering, aimed at R&amp;D, design, analytical, educational activities and teaching in the field of chemical technology.</p> <p>The main objectives of the program are to acquire the competencies needed to initiate, organize and conduct comprehensive theoretical and experimental research in the field of chemical technology and engineering; R&amp;D and innovation activities, acquirement the methodology of scientific and pedagogical work, as well as conducting original research in chemical technologies and engineering, the results of which have scientific novelty, theoretical and practical significance.</p>	
<b>3 – Characteristics of the educational program</b>	
Subject area	<p>The program is focused on the formation of competencies for applicants’ to acquire deep knowledge, skills and abilities in the specialty.</p> <p>The program is designed as an optimal combination of academic and professional requirements. The program is focused on the formation of competencies for applicants to acquire in-depth knowledge of the specialty, general scientific (philosophical) competencies, universal research skills and present their own research results orally and in writing, including in a foreign language.</p> <p>Compulsory educational components – 75% of which: disciplines of professional training – 44%, general training – 34%, learning a foreign language – 22%. Disciplines of free choice of the applicant, which provide professional training – 25% are selected from the university catalogue in accordance with the approved procedure at the University.</p>
Program orientation	Educational and scientific training for a doctor of philosophy

The main focus of the educational program	Emphasis is placed on the formation and development of professional competencies in the development and implementation of chemical technologies for polymeric and composite materials, chemical fibers, technical electrochemistry and industrial pharmacy; study of theoretical and methodological provisions, organizational and practical tools for work in this area.	
Study program features	The program is performed in an active research environment; provides for postgraduate research within the priority areas of science, government programs, national and international projects; based on a combination of modern chemical technologies, science and education, interdisciplinary research in the field of production and processing of chemical fibers, polymer and composite materials, electrochemical and pharmaceutical industries, the interaction of fundamental and applied research; provides effective use of the scientific potential of young scientists.	
<b>4 – Suitability of graduates for employment and further study</b>		
The employment suitability	The graduate is suitable for employment in enterprises, organizations and institutions operating in the field of chemical technology and engineering; Applicants are able to engage in research, teaching activities, work in higher education institutions, in R&D institutions of related fields. The applicant may hold the position of a teacher in higher education institutions, a researcher (chemistry), a chemical engineer, a chemist-analyst; research engineer, technological engineer, analyst-consultant, head of R&D divisions and subdivisions of scientific and technical preparation for production of the chemical-technological direction and related industries.	
Further study	Lifelong learning to improve professional, scientific and other activities. Possibility to continue studying according to the programs of the level of higher education (doctor of sciences).	
<b>5 – Teaching and assessment</b>		
Teaching and learning	Student-centered and problem-oriented teaching, self-study and teaching through scientific and pedagogical practice is used, including research. The system of teaching methods is based on the principles of purposefulness and binarity, which means active cooperation between the higher education seeker and the teacher. Forms of organization of the educational process: lecture, practical lesson; individual work; consultations, development of professional complex design projects; practical training.	
Assessment	Exams, credits, tests, presentations, reports, individual project-analytical tasks.	
<b>6 – Program competencies</b>		
Integral competence (IC)	Ability to produce new ideas, to solve complex problems in the field of production and processing of chemical fibers, polymer and composite materials, electrochemical and pharmaceutical industries, professional, R&D and innovation activities, to apply the methodology of scientific and pedagogical activities, as well as conduct research, the results of which have scientific novelty, theoretical and practical significance.	
General competencies (GC)	GC 1	Ability to abstract thinking, analysis and synthesis.
	GC 2	Ability to develop and manage of the projects.

	GC 3	Ability to generate new ideas (creativity).
	GC 4	Formation of a systemic scientific worldview, professional ethics and a high general cultural outlook.
	GC 5	Ability to communicate in a foreign language.
	GC 6	Ability to use information and communication technologies.
	GC 7	Ability to work in an international context.
Professional competencies (PC)	PC 1	Ability to carry out scientific and pedagogical activities.
	PC 2	Ability to master modern methodology of scientific knowledge, the ability to observe, describe, identify and classify objects of chemical technology and engineering.
	PC 3	Ability to use knowledge, skills and abilities from the disciplines of the general training cycle for the theoretical mastering the professional disciplines and the solution of practical problems of chemical technology in the preparation of their own dissertation research.
	PC 4	Ability to apply modern experimental methods of working with technological objects in industrial and laboratory conditions.
	PC 5	Ability to initiate, plan, organize and conduct comprehensive theoretical and experimental research in the field of chemical technology and engineering.
	PC 6	Ability to adapt to new situations in conditions of limited time, material and human resources. Ability to organize the work of production, research department.
<b>7 – Program learning outcomes</b>		
Knowledge and understanding:		
PLO 1	To know and understand the basic principles of work in the field of chemical technology and engineering.	
PLO 2	To understand the socio-economic, ethical, legal, environmental consequences of engineering practice.	
Application of knowledge and understanding (skills):		
PLO 3	To use general chemical engineering knowledge and understanding to solve problems in new areas of their specialization, in particular in terms of vaguely defined tasks that have competing characteristics.	
PLO 4	To be able to conduct experimental research, analyze the data obtained using mathematical apparatus and computing tools.	
PLO 5	To have the skills to develop and research the latest technologies in the field of chemical engineering.	
PLO 6	To choose innovative methods to solving the industry problems.	
PLO7	To use a creative approach to develop new original ideas and methods for conceptualizing the engineering models, systems and processes.	
PLO 8	To use chemical engineering solutions to work with complex, technically unreliable and incomplete information.	
PLO 9	To be able to identify, locate and obtain the necessary data, critically evaluate them and draw conclusions.	
PLO 10	To be able to plan and conduct analytical, modeling research to optimize chemical technologies.	
PLO 11	To be able to present the results of their own research to audiences of different levels.	

Formation of judgments:	
PLO 12	Critically understand the avant-garde role of chemical technology and engineering in the development of the country's industrial potential.
PLO13	To form and analyze financial, management, tax and statistical reporting of enterprises and correctly interpret obtained information for management decisions.
PLO14	To communicate freely on professional problems in the state and foreign languages orally and in writing, to discuss the results of professional activity with specialists and non-specialists, to argue their position on debatable issues.
<b>8 - Resource support for program implementation</b>	
<b>Staffing</b>	All academic staff who provide educational scientific program correspond to the profile and direction of the disciplines taught by qualification, have the necessary experience of scientific and pedagogical work and experience of practical work. Professionals with experience in research / management / innovation / creative work and / or work in the specialty are involved in the learning process.
<b>Logistics</b>	Logistical support allows to fully ensuring the educational process throughout the training cycle of the educational scientific program. Sanitary and technical passports that comply with current regulations certify the condition of the premises.
<b>Information and methodical support</b>	The program is fully equipped with an educational and methodological complex of all educational components, which are presented in the modular system of the educational process of the university.
<b>9 - Academic mobility</b>	
<b>National credit mobility</b>	Provides for the possibility of academic mobility in some components of the educational program, which ensure the acquisition of general and professional competencies.
<b>International credit mobility</b>	The program opens up prospects for participation and internships in research projects and academic mobility programs abroad. Performed in an active research environment, mobile under the "Double Degree" program with the University of Lithuania.
<b>Training of foreign applicants for higher education</b>	Training the foreign applicants for higher education is carried out according to accredited educational programs.

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

### 2.1 List of components of the educational scientific program

Cod	Components of the study program (study courses, courses projects (works), practices, qualification work)	Number of credits	Form of control
1	2	3	4
<b>Compulsory EP components</b>			
General courses cycle			
CC 1	<a href="#">Philosophy of science and research methodology</a>	4	exam
CC 2	<a href="#">Foreign language for academic purposes</a>	8	exam
CC 3	<a href="#">Information and communication technologies in scientific research</a>	4	test
CC 4	<a href="#">Intellectual property and commercialization of scientific research</a>	4	test
<b>Total for the cycle</b>		<b>20</b>	
Professional courses cycle			
CC 5	<a href="#">Pedagogical skills in higher education institutions</a>	4	test
CC 6	<a href="#">Chemical technologies. Theory of phenomena and processes</a>	4	exam
CC 7	<a href="#">Standard process documentation in the field</a>	4	exam
CC 8	Pedagogical practice	4	test
<b>The total amount of required components</b>		<b>16</b>	
Selective components of the educational program			
DAFC	Disciplines of applicant's free choice	12	test
<b>Total selective components</b>		<b>12</b>	
<b>TOTAL EDUCATIONALSCIENTIFICPROGRAM</b>		<b>48</b>	