

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

**EDUCATIONAL AND PROFESSIONAL PROGRAM**  
**Industrial Pharmacy**

Level of higher education First (bachelor's)

Degree of higher education Bachelor

Field of knowledge 22 Health

Specialty 226 Pharmacy, industrial pharmacy

Qualification Bachelor of Pharmacy, industrial Pharmacy

Kyiv 2021

## 1. Profile of the educational and professional program in specialty 226 Pharmacy, industrial pharmacy

<b>1 – General information</b>	
<b>Full name of the institution of higher education and structural unit</b>	Kyiv National University of Technologies and Design, Department of Industrial Pharmacy.
<b>Higher education degree and qualification in the original language</b>	Level of higher education – First (bachelor's). Higher education degree (Foreign Degree) – Bachelor. Field of knowledge – 22 Health. Specialty code – 226 Pharmacy, Industrial Pharmacy.
<b>The official name of the educational program</b>	Industrial Pharmacy.
<b>Type of diploma and scope of educational program</b>	Bachelor's degree, single, 240 ECTS credits.
<b>Cycle / level</b>	The National Qualifications Framework of Ukraine – sixth level.
<b>Availability of accreditation</b>	Certificate of accreditation of the specialty, series УД No 11005612, 03/09/2018.
<b>Prerequisites (Duration of study and degree certificate)</b>	Complete general secondary education, professional higher education or a bachelor's degree (junior specialist). In accordance with the Standard of Higher Education in the specialty based on the degree of junior bachelor (OQR junior specialist), the University recognizes and recalculates ECTS credits received under the previous educational program for junior bachelor (junior specialist).
<b>Language (s) of training</b>	Ukrainian
<b>Term of the educational program</b>	Until July 1, 2028
<b>Internet address of the permanent post of the description of the educational program</b>	<a href="http://knutd.edu.ua/ekts/">http://knutd.edu.ua/ekts/</a>
<b>2 – The purpose of the educational program (Training Objectives)</b>	
<p>Training of specialists with deep knowledge, as well as basic and professional competencies in the field of pharmacy, aimed at acquiring competencies for students to solve typical problems of the pharmaceutical industry, including technology of production (manufacture) of drugs and active pharmaceutical ingredients.</p> <p><i>The main objectives of the program are:</i> acquisition of competencies for pharmaceutical development of medicines, development of new and improvement of existing technologies of their production, quality control of raw materials, intermediates and finished pharmaceuticals in the production of medicines, creation of appropriate legal framework, definition of social priorities. provision of medicines to the population, as well as the introduction of international standards and other good practices in institutions, establishments and enterprises of the pharmaceutical sector.</p>	
<b>3 – Characteristics of the educational program</b>	
<b>Subject area</b>	The program focuses on the fundamental and applied scientific foundations of industrial production (manufacture) of drugs and active pharmaceutical ingredients, which form knowledge and skills on promising areas and tasks of the pharmaceutical sector of health care. Compulsory educational components – 75%, of which: disciplines of general training – 27.5%, vocational training – 27.5%, practical training – 10%, learning a foreign language – 10%. Disciplines of free choice of students – 25% are selected from the university catalog in accordance with the approved procedure at the University.

<b>Orientation of the program</b>	Educational and professional for bachelor's degree training.	
<b>Them ainfocus of the program and specialization</b>	Emphasis is placed on the formation and development of professional competencies in the pharmaceutical industry; study of theoretical and methodological provisions, organizational and practical tools, taking into account the specifics of pharmaceutical companies, including the development of new and improvement of existing technologies, production technology (manufacturing), quality control of medicines.	
<b>Features of the educational program</b>	The program creates conditions for employment of graduates in related fields: pharmaceutical industry, chemical biotechnology engineering, perfume and cosmetics industry; gives the opportunity to carry out scientific and practical activities in the pharmaceutical industry at all stages of the circulation of medicines, taking into account the development of science and the requirements of the labor market. Performed in an active research environment, gives the opportunity to continue studying abroad in related fields.	
<b>4 – Suitability of graduates for employment and further study</b>		
<b>Suitability for employment</b>	The graduate is suitable for employment in institutions, establishments and enterprises of the pharmaceutical, chemical, perfume-cosmetic and biotechnological industries in the positions of laboratory technician, technician-technologist, technologist and similar qualification requirements.	
<b>Fur the rtraining</b>	Opportunity to study according to the educational-scientific and / or educational-professional program of the second (master's) level of higher education.	
<b>5 – Teaching and assessment</b>		
<b>Teaching and learning</b>	Student-centered and problem-oriented learning, learning through internships 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 students of higher education. Forms of organization of the educational process: lecture, seminar, practical, laboratory classes, practical training, independent work, consultation, development of professional projects (works).	
<b>Assessment (Medium-term screening)</b>	Exams, tests, tests, professional projects (works), presentations, reports.	
<b>6 – Program competencies</b>		
<b>Integral competence (IC)</b>	Ability to solve complex specialized problems in the pharmaceutical field of professional activity.	
<b>General competencies (GC)</b>	GC 1	Ability to act socially responsible and civic conscious.
	GC 2	Ability to learn and master modern knowledge.
	GC 3	Ability to apply knowledge in practical situations.
	GC 4	Ability to understand the subject area and understand professional activities.
	GC 5	Ability to communicate in state and foreign languages both orally and in writing.
	GC 6	Skills in the use of information and communication technologies
	GC 7	Ability to search, process and analyze information from various sources.
	GC 8	Ability to work in a team.
	GC 9	The desire to preserve the environment.
	GC 10	Ability to evaluate and ensure the quality of work performed.

<b>Professional competencies (PC)</b>	PC 1	Ability to demonstrate knowledge and understanding of basic facts, concepts, rules and theories related to medicines and stages of their circulation.
	PC 2	Ability to solve problems related to the stages of circulation of medicines in the conditions of institutions, establishments and enterprises (productions) of the pharmaceutical industry, regardless of ownership.
	PC 3	Ability to use the legislative, regulatory framework of Ukraine and the requirements of good practices for professional activities.
	PC 4	Ability to use chemicals safely, taking into account their chemical and physical properties, including any risks associated with their use in professional activities.
	PC 5	Ability to monitor through observations and determine chemical, physico-chemical, biopharmaceutical, pharmaco-technological properties, etc., phenomena and changes, be able to systematize and document them.
	PC 6	Ability to develop and implement standard operating procedures using methods, techniques, instructions, guidelines and other normative documents in institutions, establishments and enterprises (productions) of the pharmaceutical industry, regardless of ownership.
	PC 7	Ability to organize the activities of institutions, establishments and enterprises for the production (manufacture) of medicinal products, including the choice of dosage form, substantiation of technology and selection of equipment in accordance with the rules of Good Practice.
	PC 8	Ability to organize the production of active pharmaceutical ingredients and excipients in the conditions of pharmaceutical enterprises in accordance with the requirements of Good Manufacturing Practice (GMP).
	PC 9	Ability to carry out activities for the development and design of documentation for a clear definition of technological processes of manufacture and production of medicines in accordance with the rules of Good Practice.
	PC 10	Ability to organize, ensure and conduct quality control of medicines in accordance with the requirements of the State Pharmacopoeia of Ukraine and good practices, determine methods of sampling for control of medicines in accordance with applicable requirements and conduct their certification.
	PC 11	Ability to ensure proper storage of medicinal products and medical devices in accordance with their physicochemical properties and the rules of Good Storage Practice.
	PC 12	Ability to carry out professional activities in accordance with the requirements of sanitary and hygienic regime, labor protection, safety and fire safety.
	PC 13	Ability to analyze and forecast the main economic indicators of pharmaceutical enterprises (industries) in accordance with current legislation of Ukraine.

	PC 14	Ability to organize and carry out general and marketing management of assortment, product innovation, pricing, sales and communication policies of pharmaceutical market participants based on the results of marketing research and taking into account market processes in national and international markets.
	PC 15	Ability to develop, implement and apply management approaches in professional activities in accordance with the principles of Good Practice in Pharmaceutical Education and the Global Framework of the International Pharmaceutical Federation (FIP).
	PC 16	Ability to conduct research and analysis of practical professional activities at the appropriate level.

### **7 – Program learning outcomes**

#### **Knowledge and understanding:**

PLO 1	Know the theoretical foundations and be able to apply the methods of chemical, physico-chemical, biological and pharmaceutical analysis, know the fundamental sections of mathematics, physics and be able to apply mathematical methods in professional activities.
PLO 2	Know the social sciences that contribute to the development of general culture and socialization of the individual, inclination to ethical values, know the history of pharmacy, economics and law, understand the causal links of society and be able to use them in professional and social activities.
PLO 3	Know modern information and communication technologies; use software and skills in computer networks, be able to create databases and use Internet resources.
PLO 4	Know the regulatory framework and rules of technological discipline of production (manufacturing), rules of operation of technological equipment, norms and rules of environmental protection, labor protection, safety, electrical and fire safety, industrial sanitation, sanitary-epidemiological regime of production at carrying out professional activities.
PLO 5	Adhere to a healthy lifestyle, care for the health and safety of employees, strive to preserve the environment.
PLO 6	Understand responsibility for one's own decisions and results of professional activity.
PLO 7	Organize and control the quality of medicines in accordance with the requirements of the State Pharmacopoeia of Ukraine and good practices, determine methods of sampling for control of medicines in accordance with current requirements and conduct their certification, prevent the spread of counterfeit medicines.
PLO 8	To know about the collection and systematization of information on the competitiveness of medicines, to demonstrate the ability to independently perform work on the formation of the product range based on the analysis of profitability and life cycle of pharmaceutical products.

#### **Application of knowledge and understanding (skills):**

PLO 9	Demonstrate written and oral communication in the native language, proficiency in English (or another foreign language), including special terminology when conducting a literary search.
PLO 10	Determine the main organoleptic, physicochemical, chemical and pharmaco-technological indicators of drugs, justify and choose methods for standardization, perform statistical processing of results in accordance with the requirements of the State Pharmacopoeia of Ukraine in raw materials, intermediates and finished products.
PLO 11	Be able to compile a prescription, recipe and material balance at the stages of the technological process of production (manufacture) of the drug, the balance of time of individual stages (operations) and production in general, heat and electricity costs in professional activities.

PLO 12	To compile and describe chemical, technological and equipment schemes of production with the application of material communications and positions of control and management of technological parameters of production (manufacture) of medicines.
PLO 13	Choose rational technology, develop and design technological documentation for the production (manufacture) of medicines, including the choice of dosage form, justification of technology and choice of equipment in accordance with the rules of Good Practice.
PLO 14	Demonstrate the ability to perform calculations of production capacity, loading of technological equipment, based on the data of calculations of material and energy flows of production (manufacturing), as well as typical calculation methods, scientific, technical and reference sources, computer technology.
PLO 15	Be able to determine the parameters of control of stages (operations) of the technological process, choose storage conditions for raw materials, intermediates, materials and finished products, control the preparation of production facilities, equipment, personnel and indoor air in carrying out professional activities.
PLO 16	Determine the influence of environmental factors: moisture, temperature, light, etc. on the stability and storage conditions of medicines and medical devices at different stages of their circulation.
PLO 17	Prepare protocols, dossiers, drawings, compile standard operating procedures, specifications, information, tables using the necessary equipment, computer equipment and technology.
PLO 18	Organize and implement general and marketing management of product range, product innovation, pricing, sales and communication policies of pharmaceutical market participants based on the results of marketing research and taking into account market processes in national and international markets.
PLO 19	Develop, implement and apply management approaches in the professional activities of pharmacies, wholesalers, manufacturing companies and other pharmaceutical organizations in accordance with the principles of Good Practice in Pharmaceutical Education and the FIP Global Framework.
PLO 20	Identify and assess factors that affect professional activities in accordance with the requirements of sanitation, labor protection, safety and fire safety.
PLO 21	Analyze and forecast the main economic indicators of pharmaceutical enterprises (industries) in accordance with current legislation of Ukraine.
<b>Formation of views:</b>	
PLO 22	Demonstrate the ability to take responsibility for the development of professional knowledge and demonstrate proficiency in both state and foreign languages.
PLO 23	Argue and evaluate the factors that affect the technology of manufacturing drugs, demonstrate skills to choose excipients for the production of dosage forms, taking into account their impact on production technology, as well as the speed and completeness of extraction of biologically active substances from the dosage form.
PLO 24	Demonstrate the ability to business communication in the professional sphere, knowledge of the basics of business communication, teamwork skills.
PLO 25	Perform professional functions taking into account the safety of life, social protection.
PLO 26	Illustrate the results of research conducted in front of the audience and organize their discussion. Demonstrate independence and responsibility in work, professional respect for ethical principles, demonstrate respect for individual and cultural diversity.
<b>8 – Resource support for program implementation</b>	
<b>Staffing</b>	All research and teaching staff that provide an educational program by qualification, correspond to the profile and direction of the educational components 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.

<b>Logistics</b>	Logistics allows to fully ensure the educational process throughout the training cycle of the educational program.
<b>Information and educational and methodical support</b>	The condition of the premises is certified by sanitary and technical passports that comply with current regulations. The program is fully equipped with an educational and methodological complex of all components of the educational program, the availability of which is presented in the modular environment 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, providing the acquisition of general and / or professional competencies.
<b>International credit mobility</b>	The program develops prospects for participation and internships in research projects and academic mobility programs abroad.
<b>Training of foreign applicants for higher education</b>	Training of foreign applicants for higher education is carried out according to accredited educational programs.

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

### 2.1 List of components of the educational-professional program of the first (bachelor) level of higher education

Code	Components of the educational program (academic disciplines, term papers (projects), practices, qualification work)	Number of credits	The form of the final control
1	2	3	4
<b>Obligatory components of the educational program</b>			
Cycle of general preparation			
EC 1	<a href="#">Ukrainian and Foreign Culture</a>	3	Test
EC 2	Foreign Language ( <a href="#">English</a> , <a href="#">German</a> , <a href="#">French</a> , <a href="#">Latin</a> )	12	Examination
EC 3	<a href="#">Business Ukrainian</a>	3	Test
EC 4	<a href="#">Philosophy, Political Science and Sociology</a>	6	Examination
EC 5	<a href="#">Foreign Language of Professional Direction</a>	12	Examination
EC 6	<a href="#">Safety and Civil Protection</a>	3	Examination
EC 7	<a href="#">Higher Mathematics</a>	6	Examination
EC 8	<a href="#">Physics</a>	6	Examination
EC 9	<a href="#">General and Inorganic Chemistry</a>	9	Examination
EC 10	<a href="#">Analytical Chemistry</a>	9	Examination
EC 11	<a href="#">Organic Chemistry</a>	9	Examination
EC 12	<a href="#">Physical and Colloid Chemistry</a>	6	Examination
EC 13	<a href="#">Informative Systems and Technologies</a>	3	Test
EC 14	<a href="#">Physical Education</a>	3 / 9*	Test
All from a cycle		90	
Cycle of professional preparation			
EC 15	<a href="#">Biochemistry and Pharmaceutical Chemistry</a>	12	Examination
EC 16	<a href="#">Technologies of Pharmaceutical Products</a>	12	Examination
EC 17	<a href="#">Technological Processes and Equipment of Pharmaceutical plants</a>	3	Examination
EC 18	General Chemical Technology	3	Examination
EC 19	<a href="#">Good Practices in the Pharmaceutical Field</a>	6	Examination
EC 20	<a href="#">Fundamentals of Industrial Pharmacy</a>	3	Test
EC 21	<a href="#">Pharmacognosy</a>	6	Examination
EC 22	Microbiology and Hygiene	6	Examination
EC 23	Basics of Pharmacology, Toxicology and Physiology	6	Examination
EC 24	Production Management	6	Test
EC 25	<a href="#">Professional Communications</a>	3	Test
EC 26	Educational Practice	18	Test
EC 27	Field Practice	6	Test
<b>Total from the cycle</b>		<b>90</b>	
<b>The total amount of required components</b>		<b>180</b>	
<b>Elective Courses</b>			
<b>DFCS</b>	Disciplines of free choice of the student	60	Test
<b>The total amount of selective components</b>		<b>60</b>	
<b>TOTAL VOLUME OF THE EDUCATIONAL PROGRAM</b>		<b>240</b>	

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



### 3. Form of certification of applicants for higher education

<b>Form of certification of applicants for higher education</b>	Attestation of a graduate of an educational program is carried out in the form of an attestation exam.
<b>Document of higher education</b>	Diploma of the state standard on awarding a bachelor's degree with a qualification: bachelor of pharmacy, industrial pharmacy.

### 4. Matrix of correspondence of general competencies to the components of the educational-professional program

	GK 1	GK 2	GK 3	GK 4	GK 5	GK 6	GK 7	GK 8	GK 9	GK 10	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6	PC 7	PC 8	PC 9	PC 10	PC 11	PC 12	PC 13	PC 14	PC 15	PC 16
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																										
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EC 25	*				*	*		*																*		
EC 26	*	*	*			*		*	*			*	*													*
EC 27		*	*	*		*	*	*	*	*	*	*	*			*		*	*	*	*			*		*

### 5. Матриця забезпечення програмних результатів навчання відповідними компонентами освітньої програми

	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	PLO 17	PLO 18	PLO 19	PLO 20	PLO 21	PLO 22	PLO 23	PLO 24	PLO 25	PLO 26
EC 1		*																				*		*		*
EC 2									*													*		*		
EC 3		*							*								*		*			*		*		*
EC 4		*																						*		
EC 5									*								*		*			*				*
EC 6				*	*	*							*		*					*	*				*	*
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EC 26		*			*		*							*		*							*			
EC 27			*	*		*		*			*	*	*		*	*		*		*	*			*	*	*