



PHARMACEUTICAL MANUFACTURING TECHNOLOGY: ROAD TO INNOVATION

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KazNU methodical conference, February 21, 2024

Agenda

The pharmaceutical industry of the Republic of Kazakhstan is currently in an extremely difficult situation, since more than 70% of the available medicines on the pharmaceutical market of Kazakhstan are imported, although the State Program on the country's drug policy provides for the introduction of highly effective, safe and affordable medicines through the unabridged use of the local resources of raw materials.

Despite the fact that over the past 7 years the volume of the pharmaceutical market has increased almost 3 times, investments are still insignificant and it is planned to reach 5% of GDP for financing of healthcare system recommended by WHO by 2027.



Medicines are objects of national security



- According to WHO requirements, to ensure the strategic security of each state, the amount of its own funds must be at least 20%;
- The revival of the country's own pharmaceutical industry is considered as the main criterion for its national security;
- To achieve the quality of manufactured medicines and increase their range, appropriate multilateral training of competitive specialists in the field of pharmaceutical manufacturing technology, in demand in the labor market of the Republic of Kazakhstan, is required.

Our achievements



The unique experience of our department in the development, creation, production and registration of drugs in various dosage forms.

The key feature of this EP is that it was developed on the basis of the leading world achievements in the field of pharmaceutical production technology, and also contains the unique experience of the faculty teachers in the development and creation of highly effective original plant-originated medicines (ointments, syrups and tinctures) under standardized names "Limonidine" and "Alchidine", as well as the synthetic drug "Rikhlokain" in the form of injections. These drugs are safe, possess anti-inflammatory, antiviral, analgesic, antioxidant and wound-healing effects, improve the body's immune status, and do not have allergic or cumulative properties.



These medicines were registered with the Ministry of Health of the Republic of Kazakhstan and entered into the State Register of Medicines of the Republic of Kazakhstan.

EP “Pharmaceutical Manufacturing Technology”

The program consists of disciplines of three cycles:

- general education disciplines;
- basic disciplines;
- major disciplines;
- number of professional internships and the final diploma work.

The cycle of *general disciplines* includes disciplines of a compulsory component and an optional component.

Socio-economic training of students is needed for an economic justification of technology of pharmaceutical manufacturing in order to ensure high labor productivity and minimal cost of products.

Psychological and social training of students is focused at formation of socio-psychological attributes required for work, providing a clear vision of the social consequences and conditions of the technical and managerial solutions.



Opportunities



New opportunities for integrating production and science to achieve the quality of manufactured products increase the requirements for appropriate multilateral training of highly competitive specialists in the field of pharmaceutical production technology. Based on the results of the annual survey of students, we have revised the list and sequence of compulsory and core disciplines in the educational program approved in 2023 with the aim of expanding their credits through the consolidation and rationality of their use.

The list of the disciplines of the university component and the elective component are based on the needs of the market, the requests of employers, established scientific schools and the individual interests of students.

The **university component** of basic disciplines in the EP for the 2023-2024 academic year consists of six modules.

1. *The natural sciences module.*
2. *The module of analytical analysis and equipment for pharmaceutical production.*
3. *The module of chemistry of organic compounds.*
4. *The module of technological processes of pharmaceutical production.*
5. *The module for compliance of a pharmaceutical production with the international standards.*
6. *The module of mechanisms of pharmaceutical processes.*



The component of choice in a **cycle of basic disciplines** includes two modules.

1. *The module of chemistry of colloidal, polymer and natural systems.*
2. *The module of physical and chemical chemistry of dispersed, polymer and natural systems.*

The **cycle of profile disciplines** (university component) includes three modules.

1. *The module for production of synthetic substances and regulatory requirements for production of medicinal products.*
2. *The module for the design of pharmaceutical production and the production of medical devices.*
3. *The module on the interaction of medicinal substances and the body.*





The **elective component** in the cycle of major disciplines includes eight modules, each of which consists of two disciplines.

In particular, the *module of safety and efficacy of drugs*.

Such disciplines as “Fundamentals of Pharmaceutical Technology”, “Industrial Technology”, “Regulatory Framework for Registration of Drugs and Their Pharmacological Supervision” are taught by highly professional employees of the leading pharmaceutical enterprises in Almaty, who have extensive, fruitful and versatile experience in the pharmaceutical industry in licensed enterprises, which operate in accordance with the GMP requirements and are well-known brands in Kazakhstan.

Attributes of a graduate of the educational program “Pharmaceutical Production Technology”



- has systematic theoretical and practical thinking in the field of pharmaceutical production technology;
- has motivation to learn, a high level of cultural development;
- has the skills to use the modern instrumental environment in professional activities;
- is able to identify, formulate, research and solve complex professional and scientific problems;
- able to form his own reasoned position on any issue;
- able to independently plan and design their own activities, integrate new ideas;
- shows initiative in professional activities;
- knows how to effectively carry out social interaction and cooperate;
- has the ability to socially adapt to global and local conditions;
- patriotic.

The educational program is relevant for the following areas of employment:



1. Pharmaceutical manufacturing enterprises of various scales of production and forms of ownership;
2. Educational, research, production and other organizations and enterprises specializing in the field of screening, preclinical research, development, research, manufacturing, standardization, quality control, storage and introduction into the production of medicines and drugs;
3. Organizations performing the functions of certification, quality control and assessment of the safety and effectiveness of medicines and drugs;
4. Establishment of consulting and distribution networks;
5. Representative offices of foreign pharmaceutical companies.

In 2019 first 166 students got enrolled in the EP “Pharmaceutical Manufacturing Technology”. There are currently 315 students enrolled in this program.

EP has successfully passed two accreditations: KAZSEE (2019), ASSIN (2023).

Its alumni employment: LLP DOSFARM, LLP VIVA-PHARM, LLP ABDI IBRAHIM GLOBAL PHARM, and other.

Thus, the competencies acquired by graduates ensure the development of their intellectual, moral and professional qualities for successful involvement in diverse, independent and fruitful activities to form a new generation of internationally renowned highly competitive specialists in the field of pharmaceutical production technology.



The Power of Teamwork: Achieving Success Together



**Thank you
for your attention!**

