

ОҢТҮСТІК ҚАЗАҚСТАН
MEDISINA
AKADEMIASY



SOUTH KAZAKHSTAN
MEDICAL
ACADEMY
АО «Южно-Казахстанская медицинская академия»

«Оңтүстік Қазақстан медицина академиясы» АҚ



EDUCATIONAL PROGRAM

Educational Program Group: B085 Pharmacy (Accelerated 3-year program)

Educational Program Code: 6B10106

Educational Program Name: Pharmacy

Educational Program Level: Bachelor's

Shymkent

The "Pharmacy" educational program was developed by the members of AC "Pharmacy":

Agreed with employers:

Director of ULE "Association of Pharmaceutical and Medical Organizations of SKO 'Damu'"

Director of LLP "Zerde Pharm"

Director of LLP "AKNIET GROUP"

Chairman of CPC "Pharmacy"

Protocol No. 9 of 18 04 2025

Approved by the Methodological Council

Vice-Rector for Academic Affairs

Protocol No. 9 of 02 05 2025

Approved by the Academic Council

Protocol No. 13 of 02 05 2025



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Passport of the educational program 6B10106 «Pharmacy»

- 1. The mission of the educational program:** Become a leader in the training of competitive highly qualified specialists in the field of pharmacy!
- 2. The purpose of the educational program** is to train competitive, qualified, competent pharmacists focused on the modern market, with deep theoretical and practical knowledge in the field of pharmacy, capable of performing production and practical tasks in professional activities.

3. Justification of the OP:

- for students (describe the reasoned evidence of the program's potential in terms of graduate employment opportunities, etc.)
- the need in the labor market (describe the reasoned evidence (society's demands, labor market needs) of the need to implement an educational program with a focus on employers)

3. Professional standard on the basis of which the educational program is developed - missing

Regulatory documents for the development of a educational program (state educational standards, professional standards (if any), etc.)

- Code of the Republic of Kazakhstan dated July 7, 2020 No. 360-VI SAM. "On the health of the people and the healthcare system", with amendments and additions as of 07/04/2022.
- The Law of the Republic of Kazakhstan "On Education" dated 07/27/2007 No. 319-III, with amendments and additions dated 07/14/2022 No. 141-VII.
- Order of the Ministry of Health of the Republic of Kazakhstan "On approval of state mandatory standards for levels of education in the field of healthcare" dated July 4, 2022 No. KR DSM-63.
- Order of the Minister of Science and Higher Education of the Republic of Kazakhstan "On approval of State mandatory standards of higher and postgraduate education" dated July 20, 2022 No. 2.
- Order of the Ministry of Education and Science of the Republic of Kazakhstan "On approval of the Rules for organizing the educational process on credit technology of education" dated April 20, 2011 No. 152, with amendments and additions as of 05/06/2021.
- Order of the Ministry of Health of the Republic of Kazakhstan "On approval of the nomenclature of specialties and specializations in the field of healthcare, nomenclature and qualification characteristics of positions of healthcare workers" dated December 21, 2020 No. KR DSM-305/2020, with amendments and additions as of 04/09/2021
- Order of the Ministry of Education and Science of the Republic of Kazakhstan "Standard rules for conducting ongoing monitoring of academic performance, intermediate and final certification of students in higher educational institutions" dated March 18, 2008 No. 125, with amendments and additions as of 05/12/2022.

- Standard rules for the activities of organizations implementing higher and postgraduate education", Decree of the Government of the Republic of Kazakhstan dated October 30, 2018 No. 595 with amendments and additions as of 12/29/2021.

- Internal regulatory documents of JSC SKMA.

6. **Field of professional activity** pharmaceutical activity in the field of circulation of medicines and medical devices.

7. **Objects of professional activity pharmaceutical enterprises;** management and pharmaceutical control bodies; testing centers; laboratories for quality control, standardization and certification; chemical and toxicological departments (laboratories) of the Center for Forensic Medicine, toxicological centers; reference and information centers, information and analytical centers, etc.; educational and scientific organizations.

General information

№	Field name	Note
1	Registration number	
2	Code and classification of the field of education	6B10 Healthcare
3	Code and classification of training areas	6B101 Healthcare
4	Educational group	B O85 «Pharmacy»
5	Educational program	6B10106 «Pharmacy»
6	Ope	Current OD
7	ISCED level	6
8	NSC level	6
9	Orc level	6
10	OT features	Nay
	UNIVERSITY PARTNER (SOP)	Nay
	UNIVERSITY PARTNER (RDO)	Nay
11	List of competencies	KK1 – Pharmaceutical activities KK2 – Management KK3 – effective communication KK4 – Leadership and team building

		<p>KK5 – Strategy for continuing professional development KK6 – research abilities</p>
12	Learning outcome	<p>LO 1 – Puts into practice knowledge and skills in the organization of pharmaceutical assistance to the population of Kazakhstan. LO 2 – Carries out wholesale and retail sales of medicines and medical devices LO 3 – Prepares medicines in pharmacy conditions LO 4 – Able to organize industrial production of medicines and medical products, to manage production processes LO 5 – Complies with the principles of organization and implementation of quality control of medicines, medicinal plant raw materials, pharmaceutical substances, standard samples, adjuvants and materials LO 6 – Able to organize and carry out chemical toxicological examination of toxicologically important substances LO7 – Knows the rules of proper use of medicines: prescribing medicines, professional advice in compliance with the principles of inclusion, providing critical information about the benefits, risks and possible contraindications of medicines LO8 – Guided by the current regulatory and legal documents in the organization of pharmaceutical activities and effectively manages the processes for the provision of medicines and medical devices in order to improve the quality of health and the performance of the healthcare system LO 9 – Possesses effective communication skills between healthcare stakeholders, motivation for continuous professional development, and cultural tolerance. LO10 – Demonstrates leadership qualities (from the early stages of a career) and the ability to work in a team. LO 11 – Committed to lifelong learning, chooses trajectories of development of individual plan of continuous professional development on the basis of constant changes in science, pharmacy and healthcare for the development of professional competencies. LO12 – Applies scientific knowledge to develop analytical and research skills, and is able</p>



		to conduct research that ensures the effectiveness, safety and quality of medicines and medical devices LO13 – Demonstrates a broad outlook, critical and analytical thinking, drawing on knowledge of social and natural sciences, digital technologies and the basics of artificial intelligence, and effectively uses modern communication tools in a professional environment.
13	Form of instruction	The field value must be derived from the IP of the specified university.
14	Language of instruction	Kazakh/Russian
15	Loan volume	180
16	Duration of study	3 years
17	Academic degree	Bachelor
18	Availability of an annex to the license for directing training	KZ73LAA00011788
19	OT accreditation	Yes
	Name of accreditation body	Independent Accreditation and Rating Agency
	Accreditation period	Bachelor's degree program - № 09.06.2020-08.06.2025
20	Discipline information	Appendix A 2



Appendix A. 1

MATRIX

correlation of the results of the education program as a whole with the competences being formed

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12	LO13
KK1	+	+	+	+	+	+	+	+	+	+	+	+	+
KK2	+	+			+		+	+	+	+	+	+	+
KK3	+	+		+	+	+	+	+	+	+	+	+	+
KK4	+	+	+	+	+	+	+	+	+	+	+	+	+
KK5	+			+	+	+	+	+	+	+	+	+	+
KK6	+					+	+			+	+	+	+

Appendix A.2

Competence Achievement/Learning Outcomes MATRIX

№	Name of discipline	Discipline brief description	Cycle (GED, BD, PD)	Component (RC, UC, CC)	Number of credits	Formation of learning outcomes (codes)
The cycle of basic disciplines (BD) The university component (RC)						
1.	History of Kazakhstan	Improving the efficiency of the healthcare system and improving the quality of medical services towards the formation of modern Kazakhstan. The specifics of the development of the pharmaceutical industry, civil and political confrontation, the creation of social and industrial infrastructure, the formation of a new intelligentsia, socio-political prospects for development and spiritual modernization, the construction of a New Kazakhstan.	BD	RC	5	LO 9 LO 10 LO 11
The cycle of basic disciplines(BD) The university component(UC)						
1.	Latin language	The role of Latin in the formation of pharmaceutical terminology. The use of the genitive case (Genetivus) for the design of the Latin part of the recipe and the designation of vegetable, animal raw materials. Names of dosage forms. Verbs functioning in pharmaceutical terminology. Using vocabulary for preparing layouts, labels, packaging	BD	UC	3	LO 1 LO 9 LO 11 LO 12
2.	Physical and colloid chemistry	Physical and colloidal chemistry is one of the main disciplines in the field of pharmaceutical education, having a significant role in the training of highly qualified specialists - pharmacists.	BD	UC	4	LO 1 LO 2 LO 5

		This subject forms chemical thinking, determines the regularities of physico-chemical processes and conditions of achieving chemical equilibrium, teaches to analyze and draw conclusions about the influence of external factors, nature of substances on the course of chemical reactions.				LO 7
3.	Organic Chemistry	Organic chemistry studies important classes of organic compounds, their nomenclature, properties that form the basis for the formation of chemical thinking and the development of orientation in the problem "Structure-properties". These include hydrocarbons and organic compound classes with those functional groups that are most characteristic of synthetic and natural origin.	BD	UC	3	LO 1 LO 6 LO 10
4.	Analytical chemistry	Acid-basic classification of cations and anions. Basic chemical methods of analysis of analytical chemistry. Essence of gravimetric analysis. Classification of methods: isolation, deposition and distillation. Use of titrimetric analysis for the study of the composition of drugs. Theoretical bases and classification of electrochemical, optical and chromatographic methods of analysis. The foundations of analytical chemistry for use in the development of drugs, expertise, standardization and research of rational drug forms.	BD	UC	3	LO 3 LO 5 LO 7 LO 10 LO 12
5.	Artificial intelligence and digitalization in pharmacy	The discipline explores the role of artificial intelligence and digitalization in pharmacy. It covers artificial intelligence technologies for pharmaceutical data analysis, production optimization, personalized drug selection, and process automation. Special attention is given to information systems, cybersecurity, and the legal and ethical aspects of artificial intelligence and digitalization in pharmacy.	BD	UC	3	LO 8 LO 12 LO 13
6.	General methods of research and analysis of drugs	State principles and regulations governing the quality of medicines. General pharmacopoeial methods for the study of drugs. Analysis of drugs of inorganic nature and organic origin of derivatives of aliphatic and alicyclic compounds	BD	UC	5	LO 5 LO 9 LO 10 LO 11 LO 12
7.	Organization of pharmaceutical	Basic principles of providing medical care to the population. Organization and regulation of the pharmaceutical retail sector. National GPP	BD	UC	5	LO 1 LO 2

	activities and the history of pharmacy	standard. Fundamental requirements for the placement and opening of pharmacies. Organization of prescription dispensing of medicines and the procedures for receiving and dispensing prescriptions. System of free drug provision. Organization of drug compounding under pharmacy conditions. In-pharmacy quality control of medicines. Documentation and dispensing procedures for medicinal products. Drug supply of hospitalized patients. Basic principles of determining the demand and studying the need for medicinal products. Organization of storage of medicinal products and pharmacy assortment goods. Pharmacy storage department. GSP standard. Distribution sector of the pharmaceutical industry of the Republic of Kazakhstan. Organization of the activities of a wholesale company and a pharmacy warehouse. GDP standard. Principles of pharmaceutical ethics and deontology. History of pharmacy. Origins of pharmacology. Traditional (folk) medicine. Development of pharmacy in the countries of the Ancient East. Pharmacy in the Middle Ages. Pharmacy practice in Russia and Kazakhstan in the 19th and 20th centuries.				LO 8 LO 9
8.	Production practice on the organization of pharmaceutical activities	Organizational and managerial work of the head of the pharmacy. Work in the pharmaceutical retail chain: the prescription and production department, the department of finished medicines, the department of over-the-counter supply. Work in the pharmacy's inventory department: supplying the pharmacy with the necessary range of medicines, receiving goods to the pharmacy, studying demand and determining the need for medicines, storing goods. Work in the pharmaceutical wholesale chain.	BD	UC	3	LO 1 LO 2 LO 8 LO 9
9.	Pathological physiology	Pathological physiology, is the theoretical basis of medicine. Pathological physiology studies the general patterns of occurrence, development and outcome of disease, as well as typical pathological processes that form the basis of disease. The basic method of general pathological physiology is the method of experimental modeling.	BD	UC	4	LO 7 LO 9 LO 11 LO 12

10.	Biological Chemistry	Biological functions and structural organization of proteins. Enzymes. The role of membranes in metabolism and their diversity. Vitamins. Specific and common paths of catabolism. Bioenergy. Exchange of carbohydrates, lipids and proteins. Macro- and trace elements. Water - salt exchange. Biochemistry of hormones. Biochemistry of liver and kidneys. Exchange of blood proteins. Biochemistry of blood. Biochemistry of tissues. Pharmaceutical biochemistry.	BD	UC	5	LO 1 LO 5 LO 8 LO 12
11.	Microbiology and virology	Principles of organization of a microbiological laboratory. Methods of microbiological research: microscopic, bacteriological, serological, biological, allergological, and molecular-genetic. Study of pathogens of infectious diseases, diagnostic value of microbiological methods, and indications for the use of specific therapeutic and preventive agents.	BD	UC	4	LO 1 LO 5 LO 9 LO 12
12	Pharmacotherapy	General principles of pharmacotherapy and clinical pharmacology. Pharmacokinetic parameters of medicinal products and methodologies for assessing pharmacodynamic effects. Prediction and evaluation of adverse drug reactions. Interdependence and relationship between pharmacokinetics and pharmacodynamics of medicinal products. General principles for evaluating the efficacy and safety of drug therapy. Clinical-pharmacological principles of pharmacotherapy for diseases of the nervous system, inflammation, and immune dysfunctions. Key symptoms and syndromes of diseases of the respiratory, cardiovascular, digestive, hepatobiliary, endocrine, urinary systems, and the hematopoietic system. Major symptoms and syndromes of infectious and inflammatory diseases. Diagnostic methods. Clinical-pharmacological principles of rational therapy. Routes of drug administration, dose selection, frequency of administration, and course duration depending on the nature and severity of the disease.	BD	UC	5	LO 1 LO 2 LO 3 LO 8 LO 11
13	Pharmacology	General patterns of pharmacodynamics and pharmacokinetics of medicinal substances, as well as drug-induced functional changes in organs and body systems. Principles of prescription writing and formulation of prescription compositions.	BD	UC	6	LO 7 LO 11 LO 12

		Calculation of drug doses and concentrations. Medicinal agents affecting the central and peripheral divisions of the nervous system and the immune system. Chemotherapeutic agents. Adverse drug reactions, methods of prevention and correction of side effects. Methodologies for selecting the most effective and safe drugs for diseases of the respiratory, cardiovascular, urinary, gastrointestinal, endocrine, and musculoskeletal systems. Adverse drug reactions and approaches to their prevention and management.				
The cycle of basic disciplines (BD)						
Component of choice (CC)						
1.	Molecular biology with the basics of medical genetics	The formation of knowledge about the molecular mechanisms of cell activity, the structure and function of genes, the analysis of genetic information for the diagnosis and treatment of hereditary diseases and the conduct of analytical and research work; skills in the diagnosis of genetic diseases and the application of molecular technologies necessary for the manufacture and quality control of medicines using digital technologies and artificial intelligence.	PD	CC	3	LO 3 LO 5 LO 12 LO 13
2.	Technology of medicinal forms	Solid dosage forms (powders), liquid dosage forms (solutions for external and internal use, IUD solutions and colloidal solutions, suspensions, emulsions, drops, infusions and decoctions), soft dosage forms (ointments, suppositories, liniments), sterile and aseptically prepared dosage forms (solutions for injection, eye ointments and drops, with antibiotics, children's dosage forms).	PD	CC	5	LO 1 LO 3 LO 9 LO 12
3	Analysis of natural biological active compounds	Analysis of medicinal products derived from terpenoids, steroid compounds, vitamins, alkaloids, and antibiotics using chemical and physicochemical methods in accordance with the requirements of regulatory documentation.	BD	CC	5	LO 5 LO 10 LO 11 LO 12
4	Medical and pharmaceutical commodity science	Materials science. Metallic material. Corrosion of tools and anticorrosion measures. Non-metallic materials. Rubber medical products. Medical products from glass and porcelain. Plastic masses and other non-metallic products. Ophthalmologic optics. Sterilization and distillation equipment. Classification of medical equipment and	BD	CC	4	LO 1 LO 8 LO 12

		pharmaceutical products. Factors that determine the quality and consumer properties of medical devices and pharmaceutical products				
5	Toxicological chemistry	Toxicological chemistry: subject, tasks, main directions and objects of research. Chemical and toxicological analysis of "medicinal" poisons, pesticides, "volatile", "metallic" poisons, caustic alkalis, mineral acids and their salts, narcotic substances in biological objects. Laboratory diagnostics of acute poisoning.	BD	EC	6	LO 6 LO 9 LO 10 LO 11 LO 12
6	Communication skills with the basics of pharmaceutical ethics	Ethics, deontology, ethical and legal basis of promotion of pharmacy products on the market. Communication, communicative process, communicative competence and principles of effective communication of pharmacist with patients of pharmacy, colleagues, doctors and other medical workers. Barriers of communication pharmacist, factors of occurrence of conflicts, ways of their resolution. The pharmacist's approaches to the patient depend on his personality, age and the nature of the disease in compliance with the principles of inclusion.	BD	EC	4	LO 1 LO 7 LO 8 LO 9 LO 10
Profile disciplines (PD) University component (UC)						
1.	Industrial technology of medicines	Tablets. Methods of production. Granulation. Coating of tablets. Standardization. Equipment used. Granules. Dragées. Microdragées. Spansules. Hard gelatin capsules. Methods of production. Microcapsules. Aseptically prepared sterile dosage forms. GMP requirements. Clean room classification. Ampoule forming and preparation for filling. Sterilization methods. Infusion solutions. Ophthalmic dosage forms. Biopharmaceutics. Pharmaceutical factors. Bioavailability. Bioequivalence.	PD	UC	6	LO 1 LO 4 LO 8 LO 12
2.	Pharmacognosy	To develop students' knowledge of medicinal plant and animal raw materials, their classification, the chemical composition of biologically active substances, methods of standardization and quality control, procurement, storage, and rational use, and to teach them how to apply this knowledge to the production and use of effective and safe natural medicines.	PD	UC	6	LO 5 LO 9 LO 10 LO 11 LO 12

						LO 13
3.	Pharmaceutical chemistry	Analysis of medicinal products derived from aromatic compounds using chemical and physicochemical methods in accordance with the requirements of regulatory documentation. Analysis of medicinal products derived from five-, six- and seven-membered heterocyclic compounds using chemical and physicochemical methods in accordance with regulatory requirements.	PD	UC	6	LO 5 LO 10 LO 11 LO 12
4.	Management and economics of pharmacy	Pharmacy management bodies in the Republic of Kazakhstan. Licensing, import and export of medicinal products and medical devices. Regulatory documents governing the activities of pharmaceutical organizations. Methods for forecasting key economic indicators. Pricing. Turnover analysis. Inventory management and stock regulation. Planning of labor and wage indicators, distribution costs, gross income, gross and net profit in a pharmacy organization. Types of accounting and accounting measurements. Regulatory and legal framework of accounting. Structure of assets and sources of their formation. Tasks of fixed asset accounting and their classification. Valuation and accounting of fixed asset acquisition. Depreciation. Cash receipt and expenditure operations. Accounting of settlements with healthcare institutions and other organizations. Payroll accounting. Balance sheet accounting. Tax system of the Republic of Kazakhstan.	PD	UC	6	LO 1 LO 8 LO 10 LO 13
5.	Production practice on industrial technology of medicines	Familiarization with the structure of the pharmacy, with the rules of operation of small-scale mechanization equipment, equipment for obtaining purified water. Familiarization with the production process for the manufacture of solid, liquid, soft, sterile and aseptically manufactured dosage forms. Familiarization with the activities of manufacturing dosage forms according to the requirements of a medical organization and doctor's prescriptions.	BD	UC	2	LO 1 LO 3 LO 9
6.	Production practice in Pharmacognosy	Acquisition of skills of practical work on organization of procurement of medicinal plant raw material, calculation of reserves, development of basic methods of collection, drying, storage and processing of medicinal plant raw material. Work to	PD	UC	2	LO 5 LO 9 LO 10

		determine the reserves of medicinal plants. Methods of cultivation of medicinal plants. Taking of medicinal plant raw material from the preparer. Packing, marking and transportation of medicinal plant raw materials. Processing of materials.				LO 11 LO 12 LO 13
7.	Production produce in management and economics of pharmacy	Work on the study of the organizational structure and management of the pharmacy organization. Study of the system of work with pharmaceutical personnel. Types of accounting and accounting measures. Study of the organization of workflow and rationalization of workflow. Work on the organization and conduct of analysis and forecasting of the main economic indicators of the pharmacy organization.	PD	UC	2	LO 1 LO 2 LO 9 LO 11 LO 12
8	Work practice: Toxicological chemistry	Forensic examination of chemical and toxicological studies of toxicologically important substances and analytical diagnostics of acute poisonings using preliminary and confirmatory methods of analysis in accordance with normative documents.	PD	UC	2	LO 6 LO 9 LO 10 LO 11 LO 12
9	Work practice: Quality control and standardization medicines	Quality control and standardization of medicines, procedures and principles of organization and conduct. Modern physical, chemical and physico-chemical methods used in pharmaceutical analysis. General pharmacopoeic research methods used for drug quality control. Modern physico-chemical (instrumental) methods for identification, analysis of purity and quantitative determination of medicines.	PD	UC	2	LO 5 LO 9 LO 10 LO 11 LO 12
Profile disciplines (PD)						
Component of choice (CC)						
1.	Technology of extract preparation	Basic concepts and terminology. State regulation of pharmaceutical manufacturing. Processes and equipment in the pharmaceutical industry. Powders. Herbal mixtures. Medicinal solutions. Syrups. Aromatic waters. Alcoholometry. Extraction methods. Tinctures. Extracts. Preparations derived from fresh plant materials. Biogenic stimulators. Highly purified phytopreparations. Individual phytopreparations. Preparations of animal origin. Enzyme preparations. Ointments. Liniments. Rectal dosage forms. Suppositories. Plasters. Aerosols.	PD	CC	5	LO 1 LO 4 LO 8 LO 12

2.	Pharmacoeconomics and pharmaceutical information in the drug life cycle system	Pharmacoeconomics in the system of drug circulation. Pharmacoepidemiological studies. Pharmacoeconomical analysis and its methods. Critical thinking and its role in pharmacoeconomical research. Pharmacoinformatics. Regulatory and informational support of pharmaceutical activities. Search for information on electronic databases. Techniques and methods of information selection. Analytical and synthetic processing of documents. Information technologies in the pharmaceutical market.	PD	CC	5	LO 1 LO 2 LO 7 LO 12 LO 13
3	Good pharmaceutical practice (GPP)	Good Pharmacy Practice (GPP) Standard. General provisions. Structure of the GPP standard. Regulatory framework of the National Pharmacy Standard (NAP). Internal pharmacy documentation. Content and recommended structure of Standard Operating Procedures (SOPs) for a pharmacy organization. Sanitary regime in the pharmacy, occupational safety, and workplace safety procedures. Organization of reception, storage, and dispensing of medicinal products and other pharmacy goods in accordance with NAP requirements. Control and supervision of pharmaceutical activities in compliance with NAP requirements.	PD	CC	5	LO 1 LO 2 LO 3 LO 8 LO 11
4.	Innovative pharmaceutical technology	Technology of developing innovative medicinal products: production of new chemical entities; synthesis of pharmacologically active metabolites or their isomers; creation of new dosage forms with improved pharmacokinetic properties. Biotechnological drugs with novel mechanisms of action. Pharmaceutical nanotechnology as a field for developing targeted drug delivery systems. Computer modeling of medicinal products. Prediction of compatibility between active pharmaceutical ingredients and excipients.	PD	UC	5	LO 1 LO 4 LO 9 LO 12 LO 13
5.	GMP and clean room technology	Cleanrooms. Classification. Requirements for air in cleanrooms, personnel requirements. Operations in NWP zones. Control of parameters of cleanrooms. Certification of cleanrooms and zones. Barrier systems. The use of insulators in the pharmaceutical industry. Systems for the preparation of air and water at pharmaceutical enterprises. Classification of filters for air purification. Designs. Principles of multi-stage air purification.	PD	UC	4	LO 1 LO 4 LO 5 LO 8

6.	Resource and ecology of medicinal plants	Resource zones and prospects of resource-related research in the Republic of Kazakhstan. Unified method of determination of reserves of medicinal plants. Ecology of medicinal plants. Influence of environmental factors on the quality of medicinal plant raw materials. Rational methods of collecting medicinal plant raw materials of various morphological groups. Good practice of GACP cultivation of medicinal plant raw materials. Identification of cultivated medicinal plants.	PD	UC	5	LO 8 LO 10 LO 12 LO 13
7.	Bioanalytical chemistry and toxicology	Issues of clinical and toxicological studies of certain groups of toxicologically important substances and prohibited substances from the WADA list. Preliminary and confirmatory methods for the determination of toxicants in biological fluids. Features of the interpretation of the obtained results	PD	UC	5	LO 6 LO 9 LO 10 LO 11 LO 12
8.	Standardization of medicines and metrology	The course "Standardization of Medicines and Metrology" studies the current state and ways of improving the standardization of medicines in the Republic of Kazakhstan, state principles and regulations governing the quality of medicines, rules for the development of regulatory documents on the control of the quality and safety of medicines, pharmacopoeial methods for quality control and standardization of medicinal substances and dosage forms, appropriate quality standards that ensure the effectiveness and safety of medicines, and the requirements of ICH "Q" series documents for the quality of medicines.	PD	UC	4	LO 5 LO 9 LO 10 LO 11 LO 12
9.	Rational use of drugs	Prediction of the risk of side effects of drugs, prevention and methods of correction when they occur, the use of clinical protocols for the diagnosis and treatment of diseases. The study of new drugs used in accordance with the rules of quality clinical practice (GCP). Maintaining medical records, based on knowledge of the legislation of the Republic of Kazakhstan in the field of health.	PD	UC	5	LO 7 LO 8 LO 10 LO 12 LO 13
10.	Pharmaceutical care	The principles of rendering the advisory help to patients within rational prescription of medicines within OTS – the list of non-prescription dispensing of medicines;	PD	UC	4	LO 1 LO 7

		consultations of patients about possible side effects of medicines and to estimation of possible interactions of medicines. Questions of compatibility and incompatibility of HP among themselves and components of food, tolerance of medicines an organism, concerning replacement of the absent medicine with a pharmacological analog. Inclusive approaches of the pharmacist to the patient when disposing of medicines.				LO 11
11.	Basics of management and marketing in pharmacy	Concept of marketing. Marketing environment and marketing mix. Functional structure of marketing. Market conditions. Market segmentation. Classification and levels of products. Pricing policy of a pharmaceutical company. Distribution activities of pharmaceutical enterprises. Marketing communication policy. Marketing research. Methodological foundations of management. Decision-making process management. Motivation of labor activity. Fundamentals of human resource management in pharmacy organizations. Styles of managing a work team.	PD	UC	6	LO 1 LO 8 LO 10 LO 11 LO 12
12.	Pharmaceutical consulting and fundamentals of pharmaceutical law	Competent pharmaceutical counseling – the recipe for success in a pharmaceutical organization. The role of the pharmacy worker as a consultant on the rational, effective, and safe use of medicinal products. Patient counseling as a key component of pharmacists' communication skills. State regulation of pharmaceutical activities. Intercultural communication and inclusion skills in counseling pharmacy patients. State control of pharmaceutical activities. Medicinal products and other medical devices as objects of legal relations.	PD	UC	4	LO 1 LO 2 LO 7 LO 13
13	Final certification	Basic principles of organization of pharmaceutical assistance to the population. Design and release of medicines. Technology of drug forms. Methods of pharmacognostic analysis. Analysis of medicinal plant raw materials containing various groups of BAV. Analysis of medicinal agents, derivatives of aromatic and			4	LO 1, LO 2, LO 3, LO 4, LO 5, LO 6,



Educational and methodological Center

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Educational program

heterocyclic compounds of synthetic origin using chemical, General pharmacodynamics and pharmacokinetics of drugs and changes in the functions of organs and systems caused by pharmacological effects.

LO 7,
LO 8,
LO 9,
LO 10,
LO 11,
LO 12
LO 13