«APPROVE»
Rector
JSC «SKMA»
Doctor of Medical Sciences,
Professor M.M. Rysbekov
«08» 09 2022 y.

EDUCATIONAL PROGRAM

Educational program code:	7M10142
Name of the educational program:	Pharmacy
Level of the educational program:	Master

Shymkent, 2022 y.

The educational program was developed by the members of the CEP:

Head of the Department of Medicine Technology, Doctor of Pharmacy, Professor — Sagyndykova B. A.

Head of the Department «Organization and Management of Pharmaceutical business», Doctor of Pharmacy, Professor — Shertaeva K. D.

Head of the Department of Pharmaceutical and Toxicological Chemistry, Doctor of Pharmacy, Professor — Ordabaeva S. K.

Head of the Department of Pharmacognosy, Ph.D. in Pharmacy, Acting Professor — Orynbasarova K. K.

Agreed with the employer:

Director of the Association of Pharmaceutical and Medical Organizations «Damu» — Alzhanova Kh. D.

Director of «Recipe» LLP — Baimbetov E. A.

Advisor to the Director of Pharmaceutical Activities of «Ecopharm International» LLP — Kenzhebaev Zh. D.

Head of the Production Department of «Zerde-Phyto» LLP — Zhumataev M. Zh.

Chairman of the CEP «Pharmacy»
Protocol № 12 05 08 2022 y. Toksanbayeva Zh.S.

Approved by the Scientific Council
Vice-Rector by SCW
Protocol № 5a 08 08 2022 y. Nurmashev B.K.

Approved by the Academic Council
Protocol № 15 08 08 2022 y.

Passport of the educational program

1. **Mission of the educational program:** Training of highly qualified scientific and pedagogical personnel with research skills in pharmacy.
2. **The purpose of the educational program:** To create, on the basis of the integration of education and science, an effective system for training scientific, scientific and pedagogical personnel in pharmacy, capable of effectively solving the problems of pharmacy, ensuring the modernization of education, science, and developing breakthrough technologies.
3. **Rationale for the educational program:** On the basis of the integration of education and science, to create an effective system for training scientific personnel capable of effectively solving pharmaceutical and managerial problems in healthcare, providing education, modernizing science, and developing innovative technologies in pharmacy.
4. **Professional standard on the basis of which the educational program has been developed:**

Regulatory documents for the development of an educational program

- Order of the Minister of Science and Higher Education of the Republic of Kazakhstan «On Approval of State Compulsory Standards of Higher and Postgraduate Education» dated July 20, 2022 No. 2.
- Order of the Minister of Health of the Republic of Kazakhstan «On Approval of State Compulsory Standards for the Levels of Education in the Field of Healthcare» dated July 4, 2022 No. KR DSM-63.
- Order of the Minister of Education and Science of the Republic of Kazakhstan «On Approval of the Rules for the Organization of the Educational Process on Credit Technology of Training in Higher and (or) Postgraduate Education Organizations» dated April 20, 2011 No. 152.
- Law of the Republic of Kazakhstan «On Education» dated July 27, 2007 No. 319-III (as amended on 04.07.2022)
- Order of the Minister of Education and Science of the Republic of Kazakhstan «On Approval of the Model Rules for the Activities of Higher and Postgraduate Education Organizations» dated October 30, 2018 No. 595 (as amended on 29.12.2021)
- «Regulations on the Procedure and Procedures for the Development of Educational Programs» of JSC «SKMA» dated 29.05.2019.
- Internal regulatory documents of JSC «SKMA»

5. Field of professional activity: Heads of pharmaceutical enterprises, pharmacist (pharmacist*), pharmacist (pharmacist*) – quality management manager in pharmacy.

6. Objects of professional activity: Organization of health care management, pharmaceutical organizations and manufacturing.

Types of professional activity:

- organizational and managerial;
- scientific and research activities.

General information

№	Characteristics of the EP	Data
1	Registration Number	7M10100087
2	Code and classification of the field of education	7M10 Healthcare
3	Code and classification of the field of study	7M101 Healthcare
4	Group of Educational Programs	M142 Pharmacy
5	Code, name of the educational program	7M10142 Pharmacy
6	Type of EP	Current EP
7	ISCED level	7
8	NQF level	7
9	IQF Level	7
10	Distinctive features of the EP	No
	Partner University (JEP)	-
	Partner University (DDEP)	-
11	List of competencies	Key competencies of the graduate of the program:

		KC1 It can effectively and successfully carry out research activities in the field of quality and safety of drug substances and medicinal plant raw materials. **KC2** Able to organize and manage the production process of the faraceutic product in accordance with GMP and GPP standards, relevant pharmaceutical practice. **KC3** Has the skills to validate analytical methods, statistical processing of test results, and compile a report on the validation of methods in accordance with international requirements. **KC4** Able to plan, organize and manage pharmaceutical activities for the storage, transportation and quality control of medicines and medical devices in accordance with the requirements of the standards of relevant pharmaceutical practices. **KC5** Competent in the field of pharmaceutical development according to the principles of relevant practices, capable of professional growth and self-analysis.
12	Learning Outcomes	**LO1** Manages and plans the activities of entities engaged in pharmaceutical activities. Organizes and carries out pharmaceutical activities in the control and licensing system in the field of circulation of medicines and medical devices. **LO2** Organizes work in subjects engaged in pharmaceutical activities to create conditions for storage, transportation and quality control of medicines and medical products. **LO3** Organizes a system for maintaining documentation that allows you to trace the actions performed in relation to medicines and medical products, received and shipped series/batch of products from the supplier to the buyer and the location of substandard medicines and medical products. **LO4** Conducts self-inspection and development of a set of measures to maintain the level of quality of medicines and medical products during their storage, sale and circulation. Organizes procedures for quality control of medicines. **LO5** Organizes and provides comprehensive advice to the population and

		specialists on the rational use of medicines and medical devices. **LO6** Demonstrates knowledge and understanding of the interdisciplinary nature of research in modern pharmaceutical science and practice in accordance with the requirements of the current legislation of the Republic of Kazakhstan and Good pharmaceutical practices (GXP). Organizes activities to ensure the quality, safety and effectiveness of medicines. **LO7** Engaged in professional growth, demonstrates introspection skills, experience for teaching at the level of higher education. **LO8** Conducts clinical and pharmaceutical documentation, conducts pharmacoeconomical analysis, supervises pharmacotherapy in accordance with the drug form of the medical organization.
13	Form of study	In-person
14	Language of instruction	Kazakh, Russian
15	Amount of loans	120
16	Degree Awarded	Master of Medical Sciences in 7M10142 «Pharmacy»
17	Duration of training	2 years
18	Availability of an appendix to the license for the direction of personnel training	KZ36LAA00011387 (018)
19	Availability of EP accreditation	Yes
	Name of accreditation body	Independent Agency for Accreditation and Rating (IAAR)
	Accreditation Certificate No., Accreditation Validity Period	No. AB 4131, 09.06.2020 – 08.06.2025
20	Information about disciplines	Annex 1.2

Annex 1

Matrix of correlation of learning outcomes for the educational program as a whole with the competencies that are being formed

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8
KC1	■					■		
KC2		■						
KC3			■					
KC4				■	■			
KC5							■	■

Annex 1.2

Matrix of achievability of competencies/learning outcomes

№	Name of the discipline	A brief description of the discipline	Cycle (BD, PD)	Component (UC, OC)	Number of credits	Generated LO (Codes)
The cycle of basic disciplines					**35**	
Mandatory / University component					**20**	
1	History and philosophy of science	Philosophy and methodology of science as branch of philosophical knowledge. Structure of scientific knowledge. Scientific rationality. Features of the present stage of science development. Science as social institute. Natural sciences in structure of modern scientific knowledge. The history of formation of sciences about society, culture, history and person. Actual philosophical problems of specific sciences.	BD	UC	3	LO7
2	Foreign language (professional)	Extension and development of skills for practical usage proficiency language of specialty, for active application of a foreign language both in daily, and in professional communication: lexicon, grammar, possession of oral speech, written skills, audition, translation.	BD	UC	3	LO7
3	Pedagogics of the higher school	Pedagogics of the higher education. The main directions and trends of development of the higher education in the modern world. New paradigm of education. The higher	BD	UC	3	LO7

		education in the Republic of Kazakhstan. The essence and structure of pedagogical activity. The theory of training at the higher school (didactics). Modern educational technologies. The organization of educational process on the basis of the credit system of training. Education quality management system.				
4	Psychology of management	The essence of administrative processes. Object of psychology management. Psychology of activity of the organization head and of his personality psychology. Functional and structural analysis of administrative activity. The psychological problems arising between the head and the staff of the organization. A clear idea of distribution on responsibility levels of the manager.	BD	UC	3	LO2 LO7
5	Teaching practice	Formation of practical skills in teaching and learning methodology. Involvement of Master's Students in Undergraduate Studies.	BD	UC	8	LO7
Optional Component (Module on Drug Technology and pharmaceutical business organization)					**15**	
6	Personnel and financial management	Formation of the internal organizational structure of the personnel management system. Methods and strategies of personnel management. Assessment of labor activity and management of business career of pharmaceutical personnel.Technologies in HR management. Financial management mechanisms. Methodological basis of financial decision-making. Improvement of accounting, balance sheet analysis, audit.	BD	OC	4	LO1

7	Good distribution practices	Infrastructure, its place and importance in good distribution practice. Features of LS as a consumer product. Principles of Good distribution practice adopted in the EU and recommended by the world health organization (WHO) a Unified approach to the organizational process of wholesale sale of medicines. Compliance with and documentation of all operating procedures.	BD	OC	4	LO3 LO4
8	Applied pharmacoeconomics	International experience in pharmacoeconomics and outcomes research. Evaluation of medical intervention in pharmacoeconomical studies. Application of modeling methods in pharmacoeconomical analysis. Algorithm for evaluation of pharmacoeconomical and pharmacoepidemiological studies and publications.. Modern possibilities of using pharmacoeconomical research in the promotion of medicines.	BD	OC	3	LO6
9	Good pharmaceutical practice	The concept of good practices in pharmacy is GXP. Approaches to implementation of GMP rules in Kazakhstan. Current state of drug development. Factors affecting the development of new drugs. Rules of good laboratory practice. Scope. Preclinical study. Stages and types of preclinical studies. GCP objectives, basic principles and requirements. Implementation of GCP in Kazakhstan.	BD	OC	4	LO3 LO4 LO6
Optional component (Pharmaceutical Chemistry and Pharmacognosy Module)					15	
10	The methodology	Application of the methodology of research work at the	BD	OC	4	LO1

	of this dissertation works	stages of development, production, production, storage and use of medicines. Organization to conduct research in accordance with the requirements of regulatory documents. Types of scientific results, criteria for their evaluation. Structure and methodical forms of the dissertation manuscript. Methods of dissertation research: search, obtain, substantiate and present the results.				LO6
11	Instrumental methods of analysis	The use of a complex of modern physicochemical methods for solving the problems posed to the researcher. In-depth study of modern physic-chemical research methods (spectral, electrochemical, etc.), mastering modern laboratory analytical and test equipment, the use of mathematical methods for processing measurement results.	BD	OC	4	LO5 LO6 LO7
12	Features of phytochemical analysis of medicinal raw materials of plant and animal origin	Determination of the chemical composition of medicinal plant materials. Classification of compounds in the group of active substances. Biosynthesis of active biologically active substances. Methods of extraction from raw materials, purification of the obtained extracts. Qualitative and quantitative determination of active substances of medicinal raw materials of plant and animal origin. Numerical indicators of the good quality of medicinal raw materials. Phytochemical analysis of medicinal raw materials of plant and animal origin.	BD	OC	3	LO2 LO7
13	Medicinal plants of traditional	Distribution and habitat. Applied medicinal raw materials, harvesting and collection time. Morphological and	BD	OC	4	LO3 LO5

	medicine	anatomical characteristics of medicinal plants. Chemical composition. The influence of plants on the human body. Use in traditional medicine. General information about the methods of use and dosages of medicinal plants used in traditional medicine.				LO7
Optional component (Module Clinical Pharmacy)					15	
14	Personalized pharmacotherapy	Introduction to personalized pharmacotherapy. Individual factors affecting the pharmacological response. The human genome. Research in the field of pharmacogenetics and pharmacogenomics. OMICS technology. Pharmacogenetic aspects of therapy for diseases of various organs and systems. Theranostika. Pharmacogenetic test systems. Database of pharmacogenetic studies. Digital technology in personalized pharmacotherapy.	BD	OC	5	LO6
15	Drug disease	Aspects of etiology and pathogenesis of drug disease. Adverse reactions to drugs. Therapeutic risk. Drug allergies. Allergy pathogenesis. Drugs and biological substances that cause adverse reactions in the therapeutic use of drugs. The etiological role of drugs in the development of collagen diseases and other diseases. The introduction of safe standards in the system of medical care.	BD	OC	5	LO5 LO6
16	Good clinical practice (GCP)	Concepts and principles of good clinical practice. Legislative aspects of clinical research. Ethics Commission. Stages of clinical studies of drugs. The	BD	OC	5	LO1 LO6

		choice of study design, work with data and record keeping. Monitoring and auditing. The procedure for registration of new drugs.				
Cycle of profile disciplines					**49**	
University component (General professional module)					**12**	
17	Fundamentals of methodology of teaching in pharmacy	Objectives of pharmaceutical education. Methods of activation of previous knowledge. Learning style. Teaching method. Rules and methods of work. Methods of assessment of knowledge, skills, attitudes, competencies and practical implementation. Features of teaching pharmaceutical disciplines. Research-based learning. Principles of organization of postgraduate and continuous professional development of pharmaceutical workers. Features of adult education. Self-education.	PD	UC	3	LO6 LO7
18	Research methodology in pharmacy	Fundamentals of research methodology in pharmacy. Goals and objectives of the discipline. The emergence and development of pharmaceutical knowledge. Pharmacy as scientific knowledge. Means and methods of scientific research. Areas of research in pharmacy. Actual problems of health care and pharmacy, modern methods of their solution. Research methodology. Characteristics of scientific activity. Means and methods of scientific research.	PD	UC	3	LO6 LO7
19	Management and marketing at pharmaceutical	Organizational model. Management as a tool for managing a pharmaceutical enterprise. Strategic management in pharmacy. Personnel management.	PD	UC	3	LO1 LO2

	companies	Quality management of pharmaceutical activities. Office work at the enterprises of pharmaceutical profile. Marketing planning in the implementation of pricing policy, promotion and distribution of ideas, products and services. Smart principle and situation analysis. Assortment management. Maintaining the competitive advantages of pharmaceutical companies.				
20	Biostatistics in pharmacy	Introduction to biostatistics. Basic concepts of probability theory. Estimation of aggregate parameters. Fundamentals of testing statistical hypotheses. The study of the relationship between qualitative and quantitative characteristics. Basics of variance analysis. Parametric and non-parametric criteria. The method of standardization, its meaning and application. Correlation analysis. Graphic images in a statistical study. The use of computer technology in the processing of statistical material. The use of measurement scales in biomedical experiment. Aggregated estimates. Comprehensive assessment. Analysis of the use of statistical methods in articles and dissertation research. The method of standardization, its meaning and application.	PD	UC	3	LO7 LO8
21	Research Practice	Familiarization with the latest theoretical, methodological and technological achievements of domestic and foreign science, modern methods of scientific research, processing and interpretation of experimental data and their application.	PD	UC	12	LO4 LO8

Optional Component (Module on Drug Technology and pharmaceutical business organization)					25	
22	Pharmaceutical and biomedical aspects of drugs	Prospects for the development of pharmaceutical technology. Medical and biological aspects of drugs. Biopharmacy and effectiveness of drugs. The influence of biopharmaceutical factors on the therapeutic efficacy of drugs. Chemical state of matter. Physical state of matter. Dosage form. Auxiliary substance. Technological process. Pharmacokinetics. Biological availability of drugs. Theoretical and practical aspects of drug production and storage. Problems improvement of drugs and new pharmaceutical technologies.	PD	OC	5	LO2 LO3 LO4
23	Organizational behavior in pharmaceutical companies	Approaches to the study of organizational behavior. Systematization of human behavior in various situations arising in the process of work. Explanation of the reasons for the actions of individuals in certain conditions. The individual and the collective. Leadership in pharmaceutical companies.. Management of people"s behavior in the process of work and their improvement. Management of innovations in the organization.	PD	OC	4	LO7
24	Management in pharmaceutical logistics	The main components in the organization of a continuous supply chain (logistics): production, acceptance of goods and input control, storage, output control, movement of the finished goods in the area of the expedition, shipment of the finished goods. Implementation of the principle of system approach in logistics. Humanization of	PD	OC	4	LO2 LO3

		technological processes. Development of logistics service. Logistic management. Adaptation of logistics systems in the face of environmental uncertainty.				
25	Management consultation	Professional management consulting in the management of pharmaceutical personnel. Specific tools of management consulting services. Organizational diagnostics in management consulting. Methods of management consulting. Types of consulting services. Consultant–client relationships organisational diagnosis Methods.	PD	OC	4	LO1 LO6
26	Technology of parapharmaceutical and nutraceutical preparations	Basic concepts, tasks, terms of the discipline «Technology of parapharmaceutical and nutraceutical drugs». Dietary supplements and public health. Natural products used in dietary supplements. Clinical efficacy of dietary supplements. The latest technologies of production of medicines used in ampelotherapy, apitherapy, aromatherapy and hirudotherapy.	PD	OC	4	LO3 LO4 LO5
27	Nanotechnology and biotechnology in pharmacy	Nanotechnology as a science. Basic concepts, tasks, terms and meanings of the subject of nanotechnology. Nanoparticles. Nanomaterials. Biomedical nanotechnology Methods for nanodiagnostics. Nanomedicine Nanotechnology, and pharmacy. Nanotechnology aspects of modern dosage form. Industrial synthesis of molecules of drugs and pharmacological preparations of clearly defined form (bis-peptides, etc.). Nanotechnology and new drugs. Modern	PD	OC	4	LO2 LO3

		drug delivery systems based on micro-and nanoparticles.				
Optional component (Pharmaceutical Chemistry and Pharmacognosy Module)					**25**	
28	Structural analysis of medicines	Modern structural research methods used for the qualitative and quantitative determination of biologically active substances and finished drugs; The theoretical basis of the used structural research methods and the scope, accuracy of the methods used; general principles of conducting an experiment using a specific structural analysis method.	PD	OC	5	LO1 LO6 LO7
29	Standardization of medicinal vegetable raw materials and phytomedicines	The general importance of medicinal plants and medicinal plant materials used in standardization in modern herbal medicine. General concept and concept of standardization, standards, concept of registration, re-registration and certification of pharmaceutical products from medicinal products in the Republic of Kazakhstan. General understanding of the required quality indicators for finished pharmaceutical products. Study of quality indicators for finished dosage forms.	PD	OC	4	LO1 LO2 LO7
30	GLP rules when creating new medicines	GLP rules in medicine quality control. Organization of the process of quality control of medicines from the stage of processing raw materials to the production of finished products; new regulatory aspects in the field of drug circulation in the European Union. Principles of preclinical studies in accordance with national and international GLP standards	PD	OC	4	LO1 LO6 LO7
31	Standardization	Visual characteristic. Qualitative and quantitative analysis	PD	OC	4	LO2

	and quality control of shredded medicinal plant materials and packaged products	and validation parameters of the method used. Physical and chemical properties of biologically active substances in ground LSR. Types of grinding method. Determination of the degree of grinding. Substantiation of the method of obtaining substances and dosage forms. Types of packaging containers. Possible processes of transformation of BAS during drying, storage, processing of medicinal plant materials.				LO4
32	State registration and re-registration of medicinal raw materials of plant and animal origin	General provisions of state registration and re-registration of plant and animal origin. The structure and content of the documents of state registration and re-registration of the LRS dossier. The procedure for the examination. Types of expertise. Types of conclusions about the safety, effectiveness and quality of herbal drugs. Amendments to the state registration and re-registration dossier of vegetable and animal origin LRS	PD	OC	4	LO1 LO8
33	State of production and quality control of medicines	State system of quality control of medicines; The legal framework of the state system of quality control of medicines. The current state and ways to improve the standardization of medicines and pharmacopoeial articles. Analytical quality assurance of medicines in accordance with the requirements of international standards.	PD	OC	4	LO4 LO6 LO7
Optional component (Module Clinical Pharmacy)					25	
34	Pharmacovigilance medicines in medical	Pharmacovigilance. Principles of good pharmacovigilance practice. Pharmacovigilance is an instrument for regulating drug circulation processes. The main directions	PD	OC	5	LO1 LO2 LO8

	organizations	of the pharmacovigilance system. Pharmacovigilance reporting system. Risk management plan and measures to minimize them in the pharmacovigilance system, the roles and responsibilities of participants in the pharmacovigilance system Characteristics of reliable pharmacovigilance systems				
35	Selection and substitutability of drugs: generics and biosimilars	Modern organization of drug supply. The study of drug substitutability in the health care system: clinical efficacy, safety, economic feasibility. The procedure for determining the substitutability of drugs for medical use. Substitution of drugs from the standpoint of pharmaceutical compliance and clinical efficacy and safety. Original and generic drugs in therapeutic practice. Problems of generic replacement: the pros and cons.	PD	OC	5	LO5 LO6
36	Clinical and economic expertise in clinical practice	Concepts of clinical and economic expertise. Economic evaluation of the quality of medical care. Methodology of evidence - based medicine in evaluating the efficacy and safety of medical technologies. Managing the quality of medical care and the role of clinical and economic analysis. Methods of pharmacoeconomic analysis VEN-ABC analysis, analysis of the cost of the disease, cost minimization, cost-effectiveness. Assessment of the quality of life in clinical and economic expertise. Polyparmacy. Monitoring the effectiveness of pharmacotherapy.	PD	OC	5	LO8
37	Introduction of the	Kazakhstan National Drug Formulary in charge of the	PD	OC	5	LO8

	Kazakhstan national formulary into clinical practice	pharmacotherapy of diseases. The role of the Kazakhstan national formulary in optimizing the use of medicines at the inpatient and outpatient level. Kazakhstan National Drug Formulary - the basis for the formation of medicinal formulations in the framework of the urban volume of free medical care				
38	Therapeutic drug monitoring	The concept of therapeutic drug monitoring, its function and practical significance. The range of therapeutic action. Research methods. Features of individual pharmacological response. Therapeutic drug monitoring in the appointment of analgesic, antimicrobial, antifungal, antiviral, antiepileptic, antiblastoma, immunosuppressive, psychoactive drugs, drugs that affect the function of the cardiovascular and respiratory systems.	PD	OC	5	LO5 LO6 LO8
Research work					**24**	
39	Master's research work, including internship and master's thesis	Research Planning in Nursing. Literature review. Research in Farmacy. Data collection and analysis. Methods of Scientific Research in Farmacy. Evaluation of the results of the study.			24	LO1 LO2 LO3 LO4 LO5 LO6 LO7 LO8
Final examination					**12**	
40	Design and defense of a master's thesis	Assessment of core competencies and learning outcomes achieved after completion of the Master's degree program.			12	LO1 LO2 LO3 LO4 LO5 LO6 LO7 LO8
TOTAL					**120**	

Annex 1.3

A matrix for achieving LO using various learning methods

LO	Teaching and learning methods	
LO1 Manages and plans the activities of entities engaged in pharmaceutical activities. Organizes and carries out pharmaceutical activities in the control and licensing system in the field of circulation of medicines and medical devices.	Lectures, seminars, analysis of pharmaceutical activities regulating pharmaceutical activities	Discussion of the results of the analysis, group work
LO2 Organizes work in subjects engaged in pharmaceutical activities to create conditions for storage, transportation and quality control of medicines and medical products.	Practical modeling	Data analysis, strategy development and decision-making, working in small groups
LO3 Organizes a system for maintaining documentation that allows you to trace the actions performed in relation to medicines and medical products, received and shipped series/batch of products from the supplier to the buyer and the location of substandard medicines and medical products.	Case study, material analysis, feedback from the undergraduate	Discussion of the results of the analysis, group work
LO4 Conducts self-inspection and development of a set of measures to maintain the level of quality of medicines and medical products during their storage, sale and circulation. Organizes procedures for quality control of medicines.	Practical modeling	Data analysis, strategy development and decision-making, working in small groups
LO5 Organizes and provides comprehensive advice to the population and specialists on the rational use of medicines and medical devices.	Material analysis, pharmaceutical activity analysis	Data analysis, strategy development and decision-making, working in small groups
LO6 Demonstrates knowledge and understanding of the interdisciplinary nature of research in modern pharmaceutical science and practice in accordance with the requirements of the current legislation of the Republic	Using interdisciplinary situations	Discussion, group assignments

of Kazakhstan and Good pharmaceutical practices (GXP). Organizes activities to ensure the quality, safety and effectiveness of medicines.		
LO7 Engaged in professional growth, demonstrates introspection skills, experience for teaching at the level of higher education.	Reflection and introspection	Data analysis, strategy development and decision-making, working in small groups
LO8 Conducts clinical and pharmaceutical documentation, conducts pharmacoeconomical analysis, supervises pharmacotherapy in accordance with the drug form of the medical organization.	Analysis of the material, conducting research in pharmaceutical science	Analysis of pharmacotherapy cases and clinical trials of products, work in small groups

Annex 1.4

The matrix of compliance of LO with assessment methods

LO	Assessment methods	
LO1 Manages and plans the activities of entities engaged in pharmaceutical activities. Organizes and carries out pharmaceutical activities in the control and licensing system in the field of circulation of medicines and medical devices.	Project activity: assessment of the quality of project execution	Publications, the level of scientific evidence and analysis
LO2 Organizes work in subjects engaged in pharmaceutical activities to create conditions for storage, transportation and quality control of medicines and medical products.	Oral exams: conducting theoretical and practical exams	Oral response, oral survey
LO3 Organizes a system for maintaining documentation that allows you to trace the actions performed in relation to medicines and medical products, received and shipped series/batch of products from the supplier to the buyer and the location of substandard medicines and medical products.	Essay (short and long)	Portfolio: creating a portfolio with the works and achievements of a graduate student to assess his overall level of training
LO4 Conducts self-inspection and development of a set of measures to maintain the level of quality of medicines and medical products during their storage, sale and circulation. Organizes procedures for quality control of medicines.	Self-assessment and discussion of the results with the teacher	Summary/presentation
LO5 Organizes and provides comprehensive advice to the population and specialists on the rational use of medicines and medical devices.	Preparation and protection of the report	Testing Oral interview
LO6 Demonstrates knowledge and understanding of the interdisciplinary nature of research in modern pharmaceutical science and practice in accordance with the requirements of the current legislation of the Republic of Kazakhstan and Good pharmaceutical practices (GXP). Organizes activities to ensure the quality, safety and effectiveness of medicines.	Testing Oral interview	Scientific research: assessment of the quality of the research work of a graduate student

LO7 Engaged in professional growth, demonstrates introspection skills, experience for teaching at the level of higher education.	Preparation of test and situational tasks	Oral response, oral survey
LO8 Conducts clinical and pharmaceutical documentation, conducts pharmacoeconomical analysis, supervises pharmacotherapy in accordance with the drug form of the medical organization.	Summary/presentation	Assessment of the quality of the undergraduate's research work, publications, the level of scientific evidence and analysis

Work plan for the entire period of study

The cycle of disciplines		Discipline code	Name of the discipline	Amount of credits	General hours	Practical lesson	MIC		1 year of study	2 year of study	Form of control
							MTIC	MIC			
1	2	3	4	5	6	7	8	9	10	11	13
BD	**UC/OC**	**BASIC DISCIPLINES**		**35**	**1050**	**350**	**210**	**490**	**35**		
BD	UC	**University component (Interdisciplinary module)**		**12**	**360**	**120**	**72**	**168**	**20**		
		M-HPS	History and philosophy of science	3	90	30	18	42	3		Exam
		M-FL	Foreign language (professional)	3	90	30	18	42	3		Exam
		M-PHS	Pedagogics of the higher school	3	90	30	18	42	3		Exam
		M-PsM	Psychology of management	3	90	30	18	42	3		Exam
		TP	**Teaching practice**	**8**	**240**	**80**	**48**	**112**	**8**		**Report**
	OC	**1) Optional Component (Module on Drug technology and pharmaceutical business organization)**		**15**	**450**	**150**	**90**	**210**	**15**		
		M-PFM	Personnel and financial management	4	120	40	24	56	4		Exam
		M-GDP	Good distribution practices	4	120	40	24	56	4		Exam
		M-APh	Applied pharmacoeconomics	3	90	30	18	42	3		Exam
		M-GPP	Good pharmaceutical practice	4	120	40	24	56	4		Exam
		2) Optional Component (Module on Pharmaceutical chemistry and pharmacognosy)		**15**	**450**	**150**	**90**	**210**	**15**		
		M-MDW	The methodology of this dissertation works'	4	120	40	24	56	4		Exam
		M-IMA	Instrumental methods of analysis (Instrumental methods of analysis)	4	120	40	24	56	4		Exam
		M-FPhAMRMPAO	Features of phytochemical analysis of medicinal raw materials of plant and animal origin	3	90	30	18	42	3		Exam

		M-MPFM	Medicinal plants in folk medicine	4	120	40	24	56	4		Exam
		3) Optional Component (Module on Clinical Pharmacy)		**15**	**450**	**150**	**90**	**210**	**15**		
		M-PPht	Personalized pharmacotherapy	5	150	50	30	70	5		Exam
		M-DD	Drug disease	5	150	50	30	70	5		Exam
		M-GCP GCP)	Good Clinical Practice (GCP)	5	150	50	30	70	5		Exam
PD	**UC/OC**	**PROFILE DISCIPLINES**		**49**	**1470**	**490**	**294**	**686**	**17**	**32**	
PD	UC	**University component (General professional module)**		**12**	**360**	**120**	**72**	**168**	**12**		
		M-FTMP	Fundamentals of teaching methodology in pharmacy	3	90	30	18	42	3		Exam
		M-MSP	Methodology of scientific research in pharmacy	3	90	30	18	42	3		Exam
		M-MMPC	Management and marketing in pharmaceutical companies	3	90	30	18	42	3		Exam
		M-Bios	Biostatistics in pharmacy	3	90	30	18	42	3		Exam
		RP	**Research practice**	**12**	**360**	**120**	**72**	**168**		**12**	**Report**
	OC	**1) Optional Component (Module on Drug technology and pharmaceutical business organization)**		**25**	**750**	**250**	**150**	**350**	**5**	**20**	
		M-PBAD	Pharmaceutical and biomedical aspects of drugs	5	150	50	30	70	5		Exam
		M-OBPhE	Organizational Behavior in Pharmaceutical Enterprises	4	120	40	24	56		4	Exam
		M-MPhL	Management in pharmaceutical logistics	4	120	40	24	56		4	Exam
		M-MCl	Management consulting	4	120	40	24	56		4	Exam
		M-TPhN	Technology of parapharmaceutical and nutraceuticals	4	120	40	24	56		4	Exam
		M-NBPh	Nanotechnology and biotechnology in pharmacy	4	120	40	24	56		4	Exam
		2) Optional Component (Module on Pharmaceutical chemistry and pharmacognosy)		**25**	**750**	**250**	**150**	**350**	**5**	**20**	
		M-SDA	Structural drug analysis	5	150	50	30	70	5		Exam
		M-SMPMHR	Standardization of medicinal plant materials and herbal remedies	4	120	40	24	56		4	Exam

		M-RCND	GLP rules for creating new drugs	4	120	40	24	56		4	Exam
		M-SQCCMPMPP	Standardization and quality control of crushed medicinal plant materials and packaged products	4	120	40	24	56		4	Exam
		M-SRRMRMPAO	State registration and re-registration of medicinal raw materials of plant and animal origin	4	120	40	24	56		4	Exam
		M-SPQCM	State of production and quality control of medicines	4	120	40	24	56		4	Exam
		3) Optional Component (Module on Clinical Pharmacy)		**25**	**750**	**250**	**150**	**350**	**5**	**20**	
		M-PhMMO	Pharmacovigilance medicines in medical organizations	5	150	50	30	70	5		Exam
		M-SSDGB	Selection and substitutability of drugs: generics and biosimilars	5	150	50	30	70		5	Exam
		M-CEECP	Clinical and economic expertise in clinical practice	5	150	50	30	70		5	Exam
		M-IKNFICP	Introduction of the Kazakhstan national formulary into clinical practice	5	150	50	30	70		5	Exam
		M-TDM	Therapeutic drug monitoring	5	150	50	30	70		5	Exam
RW		**RESEARCH WORK**		**24**	**720**	**240**	**480**		**8**	**16**	
	MRWI	Master's research work, including internship and master's thesis		3	90	30	60		3		Report
				5	150	50	100		5		
				10	300	100	200			10	
				6	180	60	120			6	
FE		**FINAL EXAMINATION**		**12**	**360**	**120**	**240**			**12**	
FE	DDMT	Design and defense of a master's thesis		12	360	120	240				
		TOTAL		**120**	**3600**	**1200**	**2400**		**60**	**60**	