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

# EDUCATIONAL PROGRAM

| | |
|---|---|
| Educational program code: | 8D10140 |
| Name of the educational program: | Pharmacy |
| Level of the educational program: | Doctorate |

**Shymkent, 2022 y.**

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

Head of the Department of Drug Technology, Doctor of Pharmaceutical Sciences, Professor — Sagyndykova B. A. _____

Head of the Department of Organization and Management of Pharmaceutical Business, Doctor of Pharmaceutical Sciences, Professor — Shertaeva K. D. _____

Head of the Department of Pharmaceutical and Toxicological Chemistry, Doctor of Pharmaceutical Sciences, Professor — Ordabayeva S. K. _____

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

**Agreed with the employer:**

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

Director of «Recept» LLP — Baimbetov E. A. _____

Advisor to the Director for Pharmaceutical Activities, «EcoPharm International» LLP — Kenzhebaev Zh. D _____

Head of Production Department of «Zerde-Fito» LLP — Zhumataev M. Zh. _____

## Passport of the educational program

1. **Mission of the educational program:** Training of highly qualified, competitive scientific and pedagogical personnel in the field of pharmacy, science and practice
2. **Purpose of the educational program:** Training of professionally qualified, competitive, competent scientific and pedagogical personnel to meet the needs of science, education and production in the field of pharmacy.
3. **The basis of the educational program:** Creation of an effective system for training scientific personnel, capable of effectively solving the problems of pharmacy and management in health care in pharmacy on the basis of the integration of education and science, ensuring the modernization of education, science, and developing breakthrough technologies.
4. **Professional standard on the basis of which the educational program is 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. **The field of professional activity:** Health care organizers, heads of state and non-state medical and non-medical institutions. Research activities in universities.

**6. Objects of professional activity:** Organizations of health care management, organizations of health care and social security, organization of higher and postgraduate education, organization of science.

Types of professional activity:

- organizational and managerial;
- scientific and research activities;
- education (pedagogical).

**General information**

| № | Characteristics of the EP | Data |
|---|---|---|
| 1 | Registration Number | 8D10100018 |
| 2 | Code and classification of the field of education | 8D10 Healthcare |
| 3 | Code and classification of the field of study | 8D101 Health Care |
| 4 | Group of Educational Programs | D140 Pharmacy |
| 5 | Code, name of the educational program | 8D10140 Pharmacy |
| 6 | Type of EP | Current EP |
| 7 | ISCED level | 8 |
| 8 | NQF level | 8 |
| 9 | IQF Level | 8 |
| 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:<br>**KC1** Able to effectively and successfully carry out research activities in the field of |

| | | |
|---|---|---|
| | | quality and safety of medicines and medicinal plant raw materials.<br>**KC2** GMP and GPP can organize and manage the manufacturing process of pharmaceutical products in accordance with the standards of the relevant pharmaceutical practices.<br>**KC3** Has the skills to validate analytical methods, statistical processing of test results, and prepare a report on the validation of methods in accordance with international requirements.<br>**KC4** Able to plan, organize and manage pharmaceutical activities to create conditions for storage, transportation and quality control and sale of medicines and medical products in accordance with the requirements of the standards of relevant pharmaceutical practices.<br>**KC5** Competent in the field of pharmaceutical development in accordance with the principles of relevant practices, capable of professional growth and self-analysis. |
| 12 | Learning Outcomes | **LO1** Organizes pharmaceutical activities in the pharmacovigilance (GVP) system and drug safety monitoring.<br>**LO2** Forms marketing services to solve operational and strategic tasks of subjects in the field of circulation of medicines and medical devices.<br>**LO3** Assesses the organization and conduct of work with medical professionals on the issues of rational pharmacotherapy and clinical trials of medicines (GCP) in medical organizations.<br>**LO4** Manages the work of the clinical and pharmaceutical service in medical and pharmaceutical organizations, manufacturers of medicines and medical devices and their representatives.<br>**LO5** Organizes a system of external and internal audit of entities engaged in pharmaceutical activities. Plans, organizes and manages the activities of entities in the field of circulation of medicines and medical devices. |

| | | |
|---|---|---|
| | | **LO6** Demonstrates self-reflection skills, a commitment to lifelong learning, and experience for teaching at the undergraduate and postgraduate levels.<br>**LO 7** Able to conduct independent research and work for scientific results in the development, production, quality control and research of medicines. Manages the organization of control over the maintenance of documentation of entities engaged in pharmaceutical activities.<br>**LO8** Demonstrates a deep understanding and mastery of methodological techniques in conducting modern research in pharmaceutical science and practice in accordance with the requirements of the current legislation of the Republic of Kazakhstan and Good Pharmaceutical Practices (GxP).<br>**LO9** Demonstrates academic writing skills, creates, structures academic text of various genre types to solve problems of a scientific nature. |
| 13 | Form of study | In-person |
| 14 | Language of instruction | Kazakh, Russian |
| 15 | Amount of loans | 180 |
| 16 | Degree Awarded | Doctor of Philosophy (PhD) in the educational program 8D10140 «Pharmacy» |
| 17 | Duration of training | 3 years |
| 18 | Availability of an appendix to the license for the direction of personnel training | KZ36LAA00011387 (020) |
| 19 | Availability of EP accreditation | No |
| | Name of accreditation body | - |
| | Accreditation Certificate No., Accreditation Validity Period | - |
| 20 | Information about disciplines | Annex 1.2 |

*Annex 1*

## Matrix of correlation of learning outcomes in the educational program as a whole with the competencies being formed

| | LO1 | LO2 | LO3 | LO4 | LO5 | LO6 | LO7 | LO8 | LO9 |
|---|---|---|---|---|---|---|---|---|---|
| KC1 | ■ | | | | | | | | ■ |
| KC2 | | ■ | | | | | | | |
| KC3 | | | ■ | ■ | | | | | |
| KC4 | | | | | ■ | | | | |
| KC5 | | | | | | ■ | ■ | ■ | |

*Annex 1.2*

## Competency attainability/learning outcomes matrix

| № | 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** | | | | | **23** | |
| 1 | Biostatistics (advanced course) | Elements of measurement theory. Methods of comparison and analysis of statistical aggregates. Nonparametric test. Method of standardization, its meaning and application. Statistical packages SPSS, SAS, Stata using computer statistical programs. Statistics on the health of the population. Statistics of the health system. Development and application of statistical methods for planning and analysis of biomedical research. Modeling opportunities in health care. | BD | UC | 3 | LO7 LO8 |
| 2 | Academic writing | The use of modern methods of scientific communication in academic writing. Comparative analysis of genres of academic writing. Construction and structuring of academic text of various genre types for solving scientific problems. Argumentation and use of sources, scientific databases. Preparation of an abstract for a scientific article, analytical review, | BD | UC | 3 | LO9 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | review. Methodology of work on the dissertation. Design of scientific projects. | | | | |
| **Module on Drug Technology and pharmaceutical business organization** | | | | | | |
| 3 | The concept of marketing research in pharmacy | The main directions of marketing research in pharmacy. Pharmaceutical marketing information. Marketing research methodology. Pharmaceutical market research. Research of marketing environment of the enterprise. Research of competitors and competitiveness of the pharmaceutical organization. Benchmarking and marketing research in the development of marketing strategies. Analytical marketing system and the provision of results. Project management. | BD | OC | 4 | LO2<br>LO6<br>LO8 |
| 4 | Pharmaceutical development and process validation | Development of technology at the stage of pharmaceutical development. Requirements for the structure and volume of pharmaceutical development. Development of technology for the production of finished drugs. Validation of technological processes at the development stage. Technology transfer in pharmaceutical development. Description of the technological process in the development. Report on the development of the product. Preclinical studies, clinical studies, bioequivalence studies. | BD | OC | 3 | LO7<br>LO8 |
| **Module on Pharmaceutical chemistry and pharmacognosy** | | | | | | |
| 5 | Methodology for conducting chemical toxicological studies | The current state of analytical studies of toxicants in bioobjects, new and very different ways of sample preparation of biological samples. Basic tests for | BD | OC | 4 | LO1<br>LO6<br>LO8 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | medicinal substances and to other toxicants. Quality standards and protocols for analytical toxicology laboratories. Evaluation, interpretation and reporting of the results of chemical toxicological studies. | | | | |
| 6 | Physic-chemical methods of testing quality indicators | Features of the use of modern high-tech and innovative instrumental methods of analysis (IR-, NIR-spectroscopy, GC-MS / MS, HPLC-MS / MS, etc.), as well as important aspects of pharmaceutical-technological testing in medicine quality control. Approbation of the developed research analysis methodologies in accordance with the harmonization guidelines (ICH). | BD | OC | 3 | LO6<br>LO7<br>LO8 |
| **Module on Clinical pharmacy** | | | | | | |
| 7 | Actual questions of the formulary system in a medical organization | Principles of work of the formulary system in a medical organization. Selection of drugs in the medical form of the medical organization. Proven clinical efficacy of drugs. The main functions of the formulary system. Tasks medicinal formular. Questions of standardization of pharmacotherapeutic care. | BD | OC | 4 | LO4 |
| 8 | Actual questions of antimicrobial therapy. Antibiotic resistance | Rational choice of antibacterial drugs for empirical therapy. Step therapy. Methods of correction and prevention of unwanted adverse reactions. Molecular genetic mechanisms of antibiotic resistance. Superbugs. Map of drug resistance. New methods for the development and delivery of antibiotics. Innovative methods to combat bacterial infection: viruses and fecal | BD | OC | 3 | LO3 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | transplantation. Antimicrobial peptides. | | | | |
| 9 | Teaching practice | Develops and organizes classes with undergraduates (students) (at least 10 classes). Participates in and analyzes the training sessions conducted by the teachers of the department. Participates and analyzes scientific and methodological seminars and conferences. Conducts practical activities with students in a scientific circle. Compiles articles of scientific and methodological nature. Prepares a report on scientific and pedagogical practice. | BD | UC | 10 | |
| **Cycle of profile disciplines** | | | | | **22** | |
| 10 | Methodology of research in pharmacy | Basics of national and international law in the field of scientific research. The order and principles of ethical regulation of health research. Scientific and research programs on sources of financing. Research Methodology. Systematic review. Meta-analysis. Implementation of the results of research, protection of intellectual rights (patenting). General requirements and rules of registration of research work. Publications in peer-reviewed journals | PD | UC | 3 | LO6<br>LO7<br>LO8 |
| **Module on Drug technology and pharmaceutical business organization** | | | | | | |
| 11 | Technology of dosage forms with modified release and modified action | New dosage forms and drug delivery systems. Dosage forms with modified release. Dosage forms with the changed mechanism and character of release of medicinal substances. Principles of modification of drug delivery and General characteristics of delivery | PD | OC | 3 | LO6<br>LO7<br>LO8 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | systems. Characteristics of drug delivery carrier systems. | | | | |
| 12 | Management bases of good practices in pharmacy | Development of the science of quality assurance and management of medicines. The regulatory framework of the RK system of quality assurance of drugs. Basic principles of Good practices in the field of drugs in Kazakhstan. Quality management. Activities of regulators in the sphere of circulation of medicines. Quality management system of enterprises – subjects of the pharmaceutical market. quality system. Internal audits (self-inspections) of pharmaceutical quality systems. The standards of good pharmacovigilance practices (GVP). Quality audit of the pharmaceutical sector of the Republic of Kazakhstan | PD | OC | 3 | LO1<br>LO5<br>LO7 |
| 13 | Organization of production of medicines according to GMP | Basic requirements of good manufacturing practice of medicines. Pharmaceutical quality system. Staff. Premises and equipment. Documentation. Technological process. Quality control. Development of drugs. Basic requirements for active substances used as feedstock. Clean room technology. Basic provisions and requirements of GMP. Basic principles of GMP. Specification for raw materials, packaging material, finished product. GMP and licensing system for the production of drugs. | PD | OC | 3 | LO6<br>LO7<br>LO8 |
| **Module on Pharmaceutical chemistry and pharmacognosy** | | | | | | |
| 14 | Good cultivation and | Regulations. Formation of the concept and strategy. | PD | OC | 3 | LO7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | harvesting practices (GACP) of medicinal plants | Implementing GACP principles. Research methods in crop production. Buildings and production area. Equipment. Documentation. Seeds and seedlings. Cultivation. Ecological aspects of the cultivation of medicinal plants. Collection Harvest. Drying and primary processing of raw materials. Packaging. Storage and distribution. | | | | LO8 |
| 15 | Modern methods of research of medicinal raw materials | Standardization of natural medicinal raw materials. Qualitative and quantitative assessment of the content of active ingredients in raw materials of natural origin. Methods for determining the authenticity and good quality of medicinal raw materials. Macroscopic and microscopic analysis of whole, ground, cut and powdered vegetable raw materials. The range of drugs of natural origin in the global pharmaceutical market. | PD | OC | 3 | LO7<br>LO8 |
| 16 | Ecological aspects and safety in obtaining medicinal plant raw materials | It is recommended to study the technology of isolation and research of medicinal raw materials from plants origin based substances and phytopreparations. Identify the relationship between the chemical structure of plant substances and their pharmacological activity. Choose nomenclature, assortment and sources of modern phytopreparations in the global pharmaceutical market. | PD | OC | 3 | LO1<br>LO2<br>LO7<br>LO8 |
| **Module on Clinical pharmacy** | | | | | | |
| 17 | Pharmacoepidemiological and pharmacoeconomic | Methodology of pharmacoepidemiological and pharmacoeconomic analysis of drugs. Pharmacoepidemiological and pharmacoeconomic | PD | OC | 3 | LO4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | analysis of the use of drugs in a medical organization | analysis of drugs for socially significant diseases. Features pharmacoepidemiology and pharmacoeconomics of medicines at the level of primary health care and hospital. Analysis of the clinical efficacy and safety of drugs in a medical organization. | | | | |
| 18 | Features of the use of drugs depending on age and gender | Physiological and premature aging. The theory of aging, especially the emotional-personal sphere in late maturity. Features of the use of drugs in pediatric and geriatric practice for various diseases of organs and systems .. Comorbidity and polymorbidity. Polypharmacy and undesirable drug interactions. Fall prevention. Compliance problems in the elderly. Features of the use of drugs depending on gender. | PD | OC | 3 | LO3 |
| 19 | Research Practice | The study of the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as the consolidation of practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research. | PD | UC | 10 | |
| **Research work** | | | | | **123** | |
| | Research work of a doctoral student, including an internship and a doctoral dissertation | Conducting independent research and working on scientific results. Forecasting the results of innovation activities. Analysis, evaluation and synthesis of new complex ideas. Publication of research results in international academic publications. | | | 123 | LO 1 LO 2 LO 3 LO 4 LO 5 LO 6 LO 7 LO 8 LO 9 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Final examination** | | | | | **12** | |
| 21 | Writing and defending a doctoral dissertation | Assessment of learning outcomes and key competencies achieved upon completion of the study of the doctoral program. | | | 12 | LO 1 LO 2 LO 3 LO 4 LO 5 LO 6 LO7 LO8 LO 9 |
| **TOTAL** | | | | | **180** | |

*Annex 1.3*

**A matrix for achieving LO using various learning methods**

| LO | Teaching and learning methods | |
|---|---|---|
| LO1 Carries out the organization of pharmaceutical activity in the system of pharmacovigilance (GVP) and monitoring of safety of medicines. | Lectures, seminars, analysis of pharmaceutical activities regulating pharmaceutical activities | Discussion of the results of the analysis, group work |
| LO2 Forms marketing services for solving operational and strategic tasks of subjects of the sphere of circulation of medicines and medical devices. | Practical modeling | Data analysis, strategy development and decision-making, working in small groups |
| LO3 Gives an assessment the organization and conduct of work with medical professionals on the issues of rational pharmacotherapy and clinical trials of drugs (GCP) in medical organizations. | Case study, material analysis, feedback from the undergraduate | Analysis of pharmacotherapy cases and clinical trials of products, work in small groups |
| LO4 Supervises the work of clinical and pharmaceutical services in medical and pharmaceutical organizations, manufacturers of medicines and medical devices and their representatives. | Organization of conferences and symposiums | Increased publication activity |
| LO5 Organizes the system of external and internal audit of entities engaged in pharmaceutical activities. Plans, organizes and manages the activities of subjects of the sphere of circulation of medicines and medical devices. | Material analysis, pharmaceutical activity analysis | Material analysis, pharmaceutical activity analysis |
| LO6 Demonstrates introspection skills, commitment to lifelong learning and experience for teaching at the tertiary and postgraduate levels. | Using interdisciplinary situations | Discussion, group assignments |
| LO7 Able to conduct independent research and work for scientific results in the development, production, quality control and research of medicines. Supervises the organization of control over the maintenance of documentation of entities engaged in pharmaceutical activities. | Reflection and introspection | Data analysis, strategy development and decision-making, working in small groups |

| | | |
|---|---|---|
| LO8 Demonstrates a deep understanding and mastery of methodological techniques in conducting modern research in pharmaceutical science and practice in accordance with the requirements of the current legislation of the Republic of Kazakhstan and Good pharmaceutical practices (GXP). | Conducting research in pharmaceutical science | Evaluation and feedback |
| LO9 Demonstrates academic writing skills, creates and structures academic text of various genre types to solve scientific problems. | Analysis of the material of academic writing, carrying out practical work | Discussion of the results of the analysis, group work |

*Annex 1.4*

**The matrix of compliance of LO with assessment methods**

| LO | Assessment methods | |
|---|---|---|
| LO1 Carries out the organization of pharmaceutical activity in the system of pharmacovigilance (GVP) and monitoring of safety of medicines. | Participation in scientific projects | Preparation and protection of the report |
| LO2 Forms marketing services for solving operational and strategic tasks of subjects of the sphere of circulation of medicines and medical devices. | Summary/presentation | Cases |
| LO3 Gives an assessment the organization and conduct of work with medical professionals on the issues of rational pharmacotherapy and clinical trials of drugs (GCP) in medical organizations. | Research work | Comments of the scientific supervisor |
| LO4 Supervises the work of clinical and pharmaceutical services in medical and pharmaceutical organizations, manufacturers of medicines and medical devices and their representatives. | The level of participation in scientific conferences and seminars | Evaluation of public performances |
| LO5 Organizes the system of external and internal audit of entities engaged in pharmaceutical activities. Plans, organizes and manages the activities of subjects of the sphere of circulation of medicines and medical devices. | Testing<br>Oral interview | Self-assessment |
| LO6 Demonstrates introspection skills, commitment to lifelong learning and experience for teaching at the tertiary and postgraduate levels. | Portfolio | Practice Report |
| LO7 Able to conduct independent research and work for scientific results in the development, production, quality control and research of medicines. Supervises the organization of control over the maintenance of documentation of entities engaged in pharmaceutical activities. | Scientific internship | Publications |
| LO8 Demonstrates a deep understanding and mastery of methodological techniques in conducting modern research in pharmaceutical science and practice in accordance with the requirements of the current legislation of the Republic of Kazakhstan and Good pharmaceutical practices (GXP). | Opinion of the scientific supervisor | Scientific publications: evaluation of a doctoral student by the number and quality of scientific publications published by |

| | | |
|---|---|---|
| | | him during his studies |
| LO9 Demonstrates academic writing skills, creates and structures academic text of various genre types to solve scientific problems. | Self-assessment of one's own knowledge, skills, and professional development | Oral response, oral survey |

## 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 | IWD | | 1 year of study | 2 year of study | 3 year of study | Form of control |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | IWDT | IWD | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| **BD** | **UC/OC** | **BASIC DISCIPLINES** | | **23** | **690** | **230** | **138** | **322** | **23** | | | |
| BD | UC | **University component** | | **6** | **180** | **60** | **36** | **84** | **6** | | | |
| | | D-Bios | Biostatistics (advanced course) | 3 | 90 | 30 | 18 | 42 | 3 | | | Exam |
| | | D-AW | Academic writing | 3 | 90 | 30 | 18 | 42 | 3 | | | Exam |
| | **TP** | **Teaching practice** | | **10** | **300** | **100** | **60** | **140** | **10** | | | **Report** |
| | OC | **1) Optional Component (Module on Drug Technology and pharmaceutical business organization)** | | **7** | **210** | **70** | **42** | **98** | **7** | | | |
| | | D-CMRPh | The concept of marketing research in pharmacy | 4 | 120 | 40 | 24 | 56 | 4 | | | Exam |
| | | D-PhDPV | Pharmaceutical development and process validation | 3 | 90 | 30 | 18 | 42 | 3 | | | Exam |
| | | **2) Optional component (Module on Pharmaceutical chemistry and pharmacognosy)** | | **7** | **210** | **70** | **42** | **98** | **7** | | | |
| | | D-MCChTS | Methodology for conducting chemical toxicological studies | 4 | 120 | 40 | 24 | 56 | 4 | | | Exam |
| | | D-PCMTQI | Physico-chemical methods of testing quality indicators | 3 | 90 | 30 | 18 | 42 | 3 | | | Exam |
| | | **3) Optional component (Module on Clinical pharmacy)** | | **7** | **210** | **70** | **42** | **98** | **7** | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | D-AQFSMO | Actual questions of the formulary system in a medical organization | 4 | 120 | 40 | 24 | 56 | 4 | | | Exam |
| | | D-AQATAR | Actual questions of antimicrobial therapy. Antibiotic resistance | 3 | 90 | 30 | 18 | 42 | 3 | | | Exam |
| **PD** | **UC/OC** | **PROFILE DISCIPLINES** | | **22** | **660** | **220** | **132** | **308** | **12** | **10** | | |
| PD | UC | **University component** | | **3** | **90** | **30** | **18** | **42** | **3** | | | |
| | | D-MRPh | Methodology of research in pharmacy | 3 | 90 | 30 | 18 | 42 | 3 | | | Exam |
| | OC | **1) Optional Component (Module on Drug Technology and pharmaceutical business organization)** | | **9** | **270** | **90** | **54** | **126** | **9** | | | |
| | | D-TDFMRMA | Technology of dosage forms with modified release and modified action | 3 | 90 | 30 | 18 | 42 | 3 | | | Exam |
| | | D-MBGPP | Management bases of good practices in pharmacy | 3 | 90 | 30 | 18 | 42 | 3 | | | Exam |
| | | D-OPMA GMP | Organization of production of medicines according to GMP | 3 | 90 | 30 | 18 | 42 | 3 | | | Exam |
| | | **2) Optional component (Module on Pharmaceutical chemistry and pharmacognosy)** | | **9** | **270** | **90** | **54** | **126** | **9** | | | |
| | | D-GCHP (GACP) MP | Good cultivation and harvesting practices (GACP) of medicinal plants | 3 | 90 | 30 | 18 | 42 | 3 | | | Exam |
| | | D-MMRMM | Modern methods of research of medicinal raw materials | 3 | 90 | 30 | 18 | 42 | 3 | | | Exam |
| | | D-EASOMPRM | Ecological aspects and safety in obtaining medicinal plant raw materials | 3 | 90 | 30 | 18 | 42 | 3 | | | Exam |
| | | **3) Optional component (Module on Clinical pharmacy)** | | **6** | **180** | **60** | **34** | **86** | **6** | | | |
| | | D-PPAUDMO | Pharmacoepidemiological and pharmacoeconomic analysis of the use of drugs in a medical organization | 3 | 90 | 30 | 18 | 42 | 3 | | | Exam |
| | | D-FUDDAG | Features of the use of drugs depending on age and gender | 3 | 90 | 30 | 18 | 42 | 3 | | | Exam |
| | **RP** | **Research practice** | | **10** | **300** | **100** | **60** | **140** | | **10** | | **Report** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **RW** | | **RESEARCH WORK** | **123** | **3600** | **1200** | **2400** | **25** | **50** | **48** | |
| | RWDS | Research work of a doctoral student, including an internship and a doctoral dissertation | 8 | 240 | 80 | 160 | 8 | | | **Report** |
| | | | 17 | 510 | 170 | 340 | 17 | | | |
| | | | 30 | 900 | 300 | 600 | | 30 | | |
| | | | 20 | 600 | 200 | 400 | | 20 | | |
| | | | 30 | 900 | 300 | 600 | | | 30 | |
| | | | 18 | 540 | 180 | 360 | | | 18 | |
| **FE** | | **FINAL EXAMINATION** | **12** | **360** | **120** | **240** | | | **12** | |
| FE | WDDD | Writing and defending a doctoral dissertation | 12 | 360 | 120 | 240 | | | 12 | |
| | | **TOTAL** | **180** | **5400** | **1800** | **3600** | **60** | **60** | **60** | |