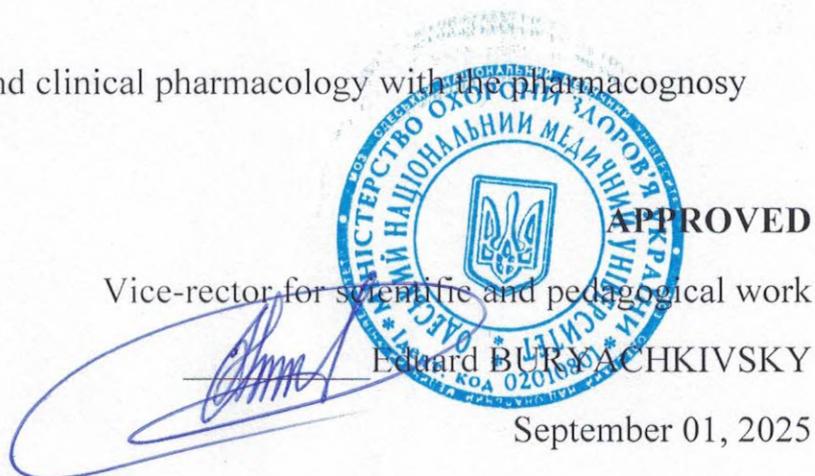


**MINISTRY OF HEALTH PROTECTION OF UKRAINE**  
**ODESSA NATIONAL MEDICAL UNIVERSITY**

Department of general and clinical pharmacology with the pharmacognosy

**APPROVED**  
Vice-rector for scientific and pedagogical work  
Edward BURKACHKIVSKY  
September 01, 2025



**WORKING PROGRAM OF EDUCATIONAL DISCIPLINE**  
**"CLINICAL PHARMACY AND PHARMACEUTICAL CARE"**

**Level of higher education:** second (master's)

**Field of knowledge:** 22 "Healthcare"

**Specialty:** 226 "Pharmacy. Industrial practice"

**Specialization:** 226.01 "Pharmacy"

**Educational and professional program:** Pharmacy. Industrial pharmacy

**2025**

The work program is based on the educational and professional program "Pharmacy, Industrial Pharmacy" for training specialists of the second (master's) level of higher education in the specialty 226 "Pharmacy, Industrial Pharmacy" specialization 226.01 "Pharmacy" field of knowledge 22 "Healthcare", approved by the Academic Council of ONMedU (minutes No. 10 dated June 27, 2024) and the educational and professional program "Pharmacy, Industrial Pharmacy" for training specialists of the second (master's) level of higher education in the specialty I8 "Pharmacy (by specializations) specialization I8.01 "Pharmacy" field of knowledge I "Healthcare and Social Security", approved by the Academic Council of ONMedU (minutes No. 8 dated April 24, 2025).

Developers:

Head of the Department of General and Clinical Pharmacology and Pharmacognosy, Doctor of Medical Sciences. Professor Rozhkovsky Ya.V.

Associate Professor of the Higher Education Institution of the Department of General and Clinical Pharmacology and Pharmacognosy, Candidate of Medical Sciences Strechen S.B.

Associate Professor of the Higher Education Institution of the Department of General and Clinical Pharmacology and Pharmacognosy, Candidate of Medical Sciences Shemonaeva K.F.

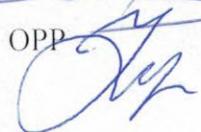
Associate professor of the Higher Education Institution of the Department of General and Clinical Pharmacology and Pharmacognosy, Candidate of Medical Sciences Bohatu S.I.

The working program was approved at the meeting of the Department of General and Clinical Pharmacology and Pharmacognosy Protocol No. 1 dated 08/28/2025

Head of the Department

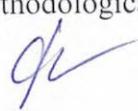
 Yaroslav ROZHKOVSKY

Agreed with the guarantor of the OPP

 Liana UNHURIAN

Approved by the Subject Cycle Methodological Commission for Pharmaceutical Disciplines of ONMedU Protocol No. 1 dated 08/29/2025

Chairman of the Subject Cycle Methodological Commission for Pharmaceutical Disciplines of ONMedU

 Nataliya FIZOR

*Reviewed and approved at the meeting of the Department* \_\_\_\_\_

*Protocol No. of « « 20*

*Head of Department* \_\_\_\_\_

*Reviewed and approved at the meeting of the Department* \_\_\_\_\_

*Minutes No. of « « 20*

*Head of Department* \_\_\_\_\_

## 1. DESCRIPTION OF THE DISCIPLINE:

Name of indicators	Field of knowledge, specialty, specialization, level of higher education	Characteristics of the academic discipline	
The total number of:  Credits: 8  Hours: 240	Field of knowledge 22 "Health care"	<i>Full-time education</i> <i>Mandatory discipline</i>	
	Specialty 226 "Pharmacy.	<i>Year of training:</i>	4, 5
	Industrial pharmacy"	<i>Semester</i>	VIII, IX
	Specialization 226.01. "Pharmacy"	<i>Lectures</i>	40 hours
	Level of higher education second (master's)	<i>Practical classes</i>	120 hours
		<i>Individual work</i>	80 hours
		<i>including individual tasks</i>	0 hours
		<i>The form of the final control is</i>	Exam

## 2. The purpose and tasks of the educational discipline, competences, program learning outcomes.

**The purpose of the discipline:** is to prepare pharmacists who have a sufficient amount of theoretical knowledge and practical skills to work with the doctor to provide the most rational drug therapy for a particular patient; having a methodology for selecting the most effective and safe medicines, as well as their combinations, taking into account the individual characteristics of the organism, the clinical form, the severity of the disease and the presence of concomitant pathology for recommendations to doctors; have a methodology of conducting, together with a doctor, clinical trials of drugs.

**The main tasks of the study of the discipline:** to prepare a specialist with a sufficient amount of theoretical knowledge and practical skills to carry out the most rational drug therapy in a particular patient, having a methodology for individual selection of effective and safe drugs based on pharmacokinetics, pharmacodynamics, pharmacodynamics, optimal dosage forms, preparation of rational combinations of drugs.

**The process of studying the discipline is aimed at forming the elements of the following competencies:**

### General (GC):

GC01. Ability to think abstractly, analyze and synthesize, learn and be modernly educated.

GC02. Knowledge and understanding of the subject area and understanding of professional activity.

GC03. Ability to communicate in the national language both orally and in writing.

GC04. The ability to communicate in a foreign language (mainly English) at a level that ensures effective professional activity.

GC05. The ability to evaluate and ensure the quality of the work performed.

GC06. Ability to work in a team.

GC07. The ability to realize one's rights and responsibilities as a member of society; to realize the values of a civil (free democratic) society and the need for its sustainable development, the rule of law, the rights and freedoms of a person and a citizen in Ukraine.

GC08. The ability to preserve and multiply moral, cultural, scientific values and achievements of society based on an understanding of the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle.

GC09. Ability to use information and communication technologies.

GC10. The ability to make decisions and act in accordance with the principle of inadmissibility of corruption and any manifestations of dishonesty.

#### **Professional (special) (PC):**

PC01. Ability to integrate knowledge and solve complex pharmacy problems in broad or multidisciplinary contexts.

PC02. The ability to collect, interpret and apply data necessary for professional activity, research and implementation of innovative projects in the field of pharmacy.

PC03. Ability to solve pharmacy problems in new or unfamiliar environments in the presence of incomplete or limited information, taking into account aspects of social and ethical responsibility.

PC04. The ability to clearly and unambiguously convey one's own knowledge, conclusions and arguments in the field of pharmacy to specialists and non-specialists, in particular to people who are studying.

PC07. The ability to carry out sanitary and educational work among the population for the purpose of prevention of common diseases, prevention of dangerous infectious, viral and parasitic diseases, as well as for the purpose of promoting timely detection and support of adherence to the treatment of these diseases according to their medico-biological characteristics and microbiological features.

PC08. The ability to consult on prescription and non-prescription drugs and other products of the pharmacy assortment; pharmaceutical care during the selection and sale of medicinal products of natural and synthetic origin by assessing the risk/benefit ratio, compatibility, taking into account biopharmaceutical, pharmacokinetic, pharmacodynamic and physicochemical and chemical features, indications/contraindications for use guided by data on the health status of a particular patient.

PC09. Ability to provide pre-medical assistance to the sick and injured in extreme situations and emergencies.

PC10. The ability to monitor the effectiveness and safety of the population's use of medicines according to data on their clinical and pharmaceutical characteristics.

PC13. The ability to organize the activities of the pharmacy to provide the population, health care institutions with medicines and other products of the pharmacy assortment and to implement appropriate reporting and accounting systems in them, to carry out product analysis, administrative record keeping taking into account the requirements of pharmaceutical legislation.

PC15. The ability to conduct an analysis of socio-economic processes in pharmacy, forms, methods and functions of the system of pharmaceutical provision of the population and its components in global practice, indicators of the need, effectiveness and availability of pharmaceutical care in terms of medical insurance and reimbursement of the cost of medicines.

**Program learning outcomes (PLO):**

PLO01. Have and apply specialized conceptual knowledge in the field of pharmacy and related fields, taking into account modern scientific achievements.

PLO02. Critically understand scientific and applied problems in the field of pharmacy.

PLO03. Have specialized knowledge and skills/skills for solving professional problems and tasks, including for the purpose of further development of knowledge and procedures in the field of pharmacy.

PLO04. Communicate freely in the national and English languages orally and in writing to discuss professional problems and results of activities, presentation of scientific research and innovative projects.

PLO05. To assess and ensure the quality and efficiency of activities in the field of pharmacy.

PLO06. Develop and make effective decisions to solve complex/complex problems of pharmacy personally and based on the results of joint discussion; formulate the goals of one's own activity and the activity of the team, taking into account public and industrial interests, the general strategy and existing limitations, determine the optimal ways to achieve goals.

PLO08. Develop and implement innovative projects in the field of pharmacy, as well as related interdisciplinary projects taking into account technical, social, economic, ethical, legal and environmental aspects.

PLO09. Formulate, argue, clearly and concretely convey to specialists and non-specialists, including those seeking higher education, information based on one's own knowledge and professional experience, the main trends in the development of world pharmacy and related industries.

PLO10. To carry out sanitary and educational work among the population for the purpose of prevention and in case of outbreaks of dangerous infectious, viral and parasitic diseases.

PLO11. Determine the advantages and disadvantages of drugs of natural and synthetic origin of various pharmacological groups, taking into account their chemical, physicochemical, biopharmaceutical, pharmacokinetic, pharmacodynamic features and the type of dosage form. Recommend to consumers medicinal products and other products of the pharmacy assortment with the provision of advisory assistance and pharmaceutical care.

PLO12. Provide pre-medical assistance to patients in emergency situations and victims in extreme situations.

PLO13. Record cases of side effects when using medicinal products of natural and synthetic origin; evaluate factors that can affect the processes of absorption, distribution,

deposition, metabolism and excretion of drugs and are determined by the condition and characteristics of the human body and the pharmaceutical characteristics of drugs.

PLO18. To use data from the analysis of socio-economic processes in society for the pharmaceutical supply of the population, to determine the effectiveness and availability of pharmaceutical care in terms of medical insurance and reimbursement of the cost of medicines.

### **Expected results of studying of the discipline:**

**As a result of studying the academic discipline, the student of higher education must:**

#### **Know:**

- The main ways of pharmacological correction of diseases, disorders of function of organs and systems.
- Nomenclature and classifications of medicinal products.
- Pharmacological and pharmacotherapeutic characteristics of the main groups of medicines.
- Indications and contraindications to the use of medicines
- Manifestations of possible adverse reactions to drugs, symptoms of overdose with potent and toxic drugs, methods of prevention and treatment principles.

#### **Be able to:**

- Write and analyze prescriptions for medicines in different dosage forms in accordance with the current legislation of Ukraine.
- Determine the group membership of medicines according to current classifications;
- Give pharmacological and pharmacotherapeutic characteristics to drugs, logically link the mechanism of action with pharmacodynamics, pharmacodynamics with indications, and side effects with contraindications to their use;
- Calculate a single dose of the drug depending on the age, body weight or surface area of the patient's body;
- To determine, depending on the peculiarities of the pharmacokinetics of medicinal products, the frequency of administration of the medicinal product, its daily dose, the course dose in patients of different ages in accordance with concomitant diseases and the use of other drugs;
- Justify the appropriate dosage form according to the route of administration
- Predict the effects of the interaction of drugs with their combined administration, drugs and components of food, drugs and alcohol;
- Evaluate the benefit / risk balance when using medicines;
- To determine the manifestations of possible adverse reactions of drugs, symptoms of overdose with potent and toxic drugs, methods of their prevention and principles of treatment;
- To carry out the analysis of pharmacological information in modern directories, scientific and professional periodicals;

- Give comparative characterization of medicines in terms of efficacy, safety, mechanism of action, indications for use, etc.

### **3. CONTENT OF THE DISCIPLINE**

**The program includes 2 content modules: general and applied aspects of clinical pharmacy and pharmaceutical care.**

#### **Content module 1 of the discipline. General questions of clinical pharmacy.**

The general section reveals a systematic approach to the study of discipline, gives an idea of the subject, the purpose of its study, connection with other sciences and practical activity of the doctor.

The purpose of the general section is to provide students with motivation for the perception and development of specific material in clinical pharmacy by students.

**Topic 1.** Introduction to clinical pharmacy. The subject, tasks, basic principles of clinical pharmacy.

Content of clinical pharmacy and its tasks. Relationship between clinical pharmacy and related disciplines. The role of clinical pharmacy (CF) in the pharmaceutical education system. World experience of CF development. Ethics and Deontology in Medicine and Pharmacy Deontological aspects of the relationship of doctor-doctor, pharmacist-patient, pharmacist-visitor.

**Topic 2.** Basic methods of clinical examination of patients. Types of medical records. Medical history.

Definition and value of subjective, physical and laboratory-instrumental methods of research of patients. The main types of medical records and the practical importance of the information they contain for the doctor and the physician. Definition of anamnesis, special value of information on the use of drugs for the doctor and the doctor.

**Topic 3.** Clinical pharmacology: basic principles and provisions of the discipline. Fundamentals of clinical biopharmacy. Side effect of drugs. Pharmacovigilance system in Ukraine and in the World for the safety of drug use.

Introduction to clinical pharmacology. Types of drug therapy. Clinical aspects of pharmacodynamics, pharmacokinetics of drugs, definitions of "clinical effect", "side effect". Modern methods of evaluation of pharmacological action of drugs in clinical pharmacology. The selectivity of the action of drugs and its clinical significance clinical and pharmacological tests.

Definition of the term "biopharmacy". General concepts. Types of doses, their characteristics. Methods of administration of drugs, their clinical relevance. Forms of release of drugs. Features of pharmacological action of drugs, depending on the form and method of administration to the patient.

Classification of types of side effects of drugs. Mechanisms of origin and methods of forecasting the possible development of adverse effects of drugs. Dependence of negative influence on the dose, route and mode of administration. Clinical manifestations of side effects of drugs. Methods of prevention and treatment of side effects of drugs.

Worldwide experience of monitoring side effects of drugs. Concept of medical monitoring. Ways to detect side effects. Structures and authorities in Ukraine that oversee the safety of medicines. The main regulatory documents that provide pharmacological control.

## **Content module 2 of the discipline. Applied aspects of clinical pharmacy and pharmaceutical care.**

This section describes the clinical pharmacy of medicines widely used in practical medicine and pharmacy.

Purpose of the section: to provide a methodology for selecting pharmacological groups and specific drugs, taking into account the data of pharmacokinetics, pharmacodynamics, interaction and side effects depending on the patient's condition.

**Topic 4.** Clinico-pharmaceutical principles of the choice of bronchodilator drugs.

Pathogenesis of bronchial obstruction syndrome. The main diseases in which the development of bronchospastic mechanism is possible. Classification of bronchospasmolytics. Pharmacodynamics, pharmacokinetics of adrenomimetics, M-cholin blockers, phosphodiesterase inhibitors. Features of dosing, introduction of drugs. Possible side effects. Methods for monitoring the effectiveness and safety of bronchodilators.

**Topic 5.** Clinical and pharmaceutical features of the choice of antimicrobial drugs in pulmonology.

Etiopathogenetic mechanisms of pneumonia, acute and chronic bronchitis, specific inflammatory lesions of the respiratory system. The rational choice of antimicrobial drugs for the treatment of infectious-inflammatory diseases of the respiratory system. The main pharmacological characteristics of the various groups of antibacterial drugs most commonly used in pulmonology.

**Topic 6.** Clinical and pharmaceutical principles of the choice of mucolytic, antihistamine, antitussive drugs.

Pathogenetic mechanisms of cough, bronchial mucosa edema. Classification of these groups of drugs. Features of pharmacodynamics, pharmacokinetics. Dosing principles. Control of efficiency and safety of application.

**Topic 7.** Clinical and pharmaceutical principles of the choice of antihypertensive drugs.

Classification and definition of hypertension. Pathogenesis of primary and secondary arterial hypertension. Principles of pharmacotherapy of high blood pressure. Classification of antihypertensive and antihypertensive drugs. Clinical and pharmacological characteristics of beta-blockers, calcium antagonists, ACE inhibitors, angiotensin 2 receptor antagonists, diuretics. Methods and criteria for evaluating the effectiveness and safety of antihypertensive drugs.

**Topic 8.** Clinical and pharmaceutical principles of the choice of hypertensive drugs. Principles of treatment of hypertensive crises and acute hypotensive conditions.

Classification and definition of arterial hypotension. Pathogenesis of arterial hypotension. Principles of pharmacotherapy of low blood pressure. Classification of hypertensive drugs. Clinical and pharmacological characteristics of hypertensive drugs. Methods and criteria for evaluating the effectiveness and safety of hypertensive drugs.

Definition and classification of hypertensive crises. Clinic and principles of treatment of uncomplicated hypertensive crises. Clinic and principles of choice of drugs for treatment of complicated hypertensive crises. Definition and clinical characteristics of acute hypotension (dizziness, collapse, shock. Clinical and pharmacological characteristics of drugs used for the treatment of acute disorders of blood pressure.

**Topic 9.** Clinical and pharmaceutical approaches of the choice of antianginal and antiischemic drugs.

**Topic 10.** Clinico-pharmaceutical principles of choice of anticoagulants, antiplatelet agents, thrombolytics. Clinical and pharmaceutical approaches for the selection of lipid-lowering drugs.

The role and significance of coagulation disorders in the pathogenesis of disorders of the coronary and other types of circulation. Clinical pharmacology of direct and indirect anticoagulants, antiplatelet agents, thrombolytic drugs.

Pathogenetic mechanisms of lipid metabolism disorders. Classification of dyslipoproteinemias. Clinical pharmacology of lipid-lowering drugs (HMG-CoA reductase inhibitors, fibrous acid derivatives, nicotinic acid derivatives, bile acid sequestrants). Principles of non-drug treatment of lipid metabolism disorders.

**Topic 11.** Principles of treatment of angina pectoris, acute myocardial infarction.

Clinical and diagnostic criteria for angina pectoris. Clinic for acute myocardial infarction. Principles of treatment of acute coronary conditions. Clinical pharmacology of drugs used to provide acute emergency care for angina pectoris and myocardial infarction.

**Topic 12.** Student research work: curation of patients, work with medical documentation, review and discussion of medical prescriptions, clinical and pharmaceutical analysis.

**Topic 13.** Clinical and pharmaceutical principles of the choice of cardiac glycosides and other positive cardiotonic agents.

Determination of the basic functions of the heart. Etiology, pathogenesis, clinic of heart failure. Principles of choosing drugs for the treatment of heart failure. Classification of cardiac glycosides. Clinical pharmacology of cardiac glycosides. Cardiac glycoside intoxication: clinical manifestations, prevention, treatment. Clinical pharmacology of non-glycosidic positive inotropic drugs.

**Topic 14.** Clinical and pharmaceutical principles of choice of diuretic drugs.

Swelling syndrome: etiology, pathogenesis. Features of edema syndrome in diseases of the heart, liver, kidneys. Classification of diuretics. Clinical pharmacology of loop diuretics, thiazide and thiazide diuretics, osmotic diuretics, potassium preservatives. Methods and criteria for evaluating the effectiveness and safety of diuretic drugs.

**Topic 15.** Clinical and pharmaceutical principles of choice of antiarrhythmic drugs.

Etiology, pathogenesis of various disorders of heart rhythm and conduction. Clinical manifestations of cardiac arrhythmias. Classification of antiarrhythmic drugs for the treatment of tachy- and bradyarrhythmias. Clinical pharmacology of drugs for normalization of heart rhythm. Methods and criteria for the effectiveness and safety of antiarrhythmic drugs.

**Topic 16.** Principles of treatment of cardiac asthma, pulmonary edema. Principles of treatment of urgent heart rhythm disorders.

Etiology, pathogenesis of acute heart failure. Classification and clinical manifestations of acute heart failure. Principles of pharmacotherapy. Clinical pharmacology of drugs used to treat acute heart failure.

Etiology, pathogenesis, clinic, determination of paroxysmal tachycardia, atrial fibrillation, complete atrioventricular blockade. Clinical pharmacology of drugs used in urgent heart rhythm disorders.

**Topic 17.** Clinical and pharmaceutical principles of the choice of non-steroidal anti-inflammatory drugs.

Etiology, pathogenesis, clinic of inflammation. Definition of inflammation as a non-specific pathological process. Classification of non-steroidal anti-inflammatory drugs. Clinical pharmacology of different groups of non-steroidal anti-inflammatory drugs.

**Topic 18.** Clinical and pharmaceutical principles of the choice of steroidal anti-inflammatory drugs (glucocorticosteroids).

Physiology of the hypothalamic-pituitary-adrenal system. Classification and basic preparations of glucocorticosteroids. Clinical pharmacology of synthetic steroidal anti-inflammatory drugs. Current special forms of glucocorticosteroid use: advantages and disadvantages.

**Topic 19.** Side effects of anti-inflammatory drugs: their prevention and treatment.

Side effects with the use of non-steroidal anti-inflammatory drugs, glucocorticosteroids, basic anti-inflammatory drugs. Their prevention and treatment. Methods and methods of controlling the safety of anti-inflammatory drugs.

**Topic 20.** Protecting students' research work: quality, correctness, conformity of the writing scheme, validity of conclusions, oral defense.

**Topic 21.** Clinical and pharmaceutical principles of the choice of vitamins, drugs of metabolic type of action.

Classification of vitamins. Features of use of water and fat-soluble vitamins. Clinical and pharmacological features of vitamins. Clinical pharmacology of drugs that improve metabolic processes. Methods for evaluating the effectiveness and safety of the use of vitamins and drugs of metabolic type of action.

**Topic 22.** Clinical and pharmaceutical principles of choice of anti-anemic drugs. Clinico-pharmaceutical principles for the selection of hemostatics.

The concept of anemia. Classification of anemias. Symptoms and syndromes in anemia. Clinical pharmacology of iron and other drugs used to treat anemic syndrome. Efficacy and safety criteria for the use of drugs for the treatment of anemia.

Hemostasis system: physiological and pathophysiological features of functioning. Classification of hemostatics. Clinical and pharmacological features of the use of direct, indirect hemostatics, reagents, fibrinolysis inhibitors, vascular wall stabilizers.

**Topic 23.** Clinical and pharmaceutical principles of the choice of antimicrobial drugs in urological practice.

The main urological diseases that require the appointment of antimicrobial therapy. Leading microorganisms that are the cause of infectious-inflammatory diseases in urological practice. Symptoms and syndromes of infectious-inflammatory urological diseases. Clinical pharmacology of antibacterial drugs, which are most often used for the treatment of infectious-inflammatory processes of the kidneys, bladder, urethra, prostate.

**Topic 24.** Clinical and pharmaceutical principles of the choice of drugs for the treatment of urolithiasis. Clinical and pharmaceutical principles for the selection of drugs for the treatment of benign prostatic hyperplasia.

Methods and possibilities of laboratory and instrumental diagnosis of urolithiasis. Clinical pharmacology of drugs that prevent the formation of stones, urological agents. The concept of renal colic. Clinical pharmacology of drugs intended for the treatment of renal colic (antispasmodics, cholin blockers, analgesics, combined drugs). Performance and safety criteria.

Modern ideas about BPH. Symptoms, methods of diagnosis of BPH. Basic methods of operative and conservative treatment of BPH. Clinical pharmacology of drugs used for the conservative treatment of BPH (alpha-blockers, herbal remedies, hormonal drugs, 5-alpha reductase inhibitors).

**Topic 25.** Clinical and pharmaceutical principles of choice of antisecretory drugs. Clinical and pharmaceutical principles of choice of antacids.

Acid-dependent diseases of the gastrointestinal tract - pathogenesis. Physiology and pathophysiology regulation of gastric secretion. Symptoms in acid-dependent diseases of the gastrointestinal tract, symptoms in which the appointment of OTC drugs is possible. Classification of antisecretory drugs. Clinical pharmacology of H2-histaminoblockers, M-cholinoblockers, proton pump inhibitors.

Classification of antacids. Clinical pharmacology of systemic and non-systemic antacids. Option of OTC antacids. Performance and safety criteria for their application.

**Topic 26.** Clinical and pharmaceutical principles of the choice of hepatoprotectors. Clinical and pharmaceutical principles of choice of choleric, cholecinetics.

Symptoms and syndromes of liver disease. Methods of laboratory and instrumental diagnostics of liver diseases. Principles of drug treatment of liver diseases. Classification and clinical pharmacology of major groups of hepatoprotective drugs.

Mechanisms of regulation of bile secretion. Classification of drugs that affect the synthesis and excretion of bile. Clinical pharmacology of choleric, cholecinetics, cholecystokinetics. The concept of bilious colic. Clinical pharmacology of drugs for the treatment of biliary colic (antispasmodics, cholin blockers, analgesics, combined drugs).

**Topic 27.** Clinical and pharmaceutical principles of the choice of drugs for use in hypoacid conditions and intestinal dysbiosis. Clinical and pharmaceutical principles of choice of enzyme and anti-enzyme drugs.

Clinical pharmacology of drugs that stimulate the synthesis of hydrochloric acid in the stomach. Means of substitution therapy. The concept of dysbiosis. Physiology and pathology of regulation of intestinal contents. Classification of drugs that normalize the intestinal microflora. Clinical pharmacology of probiotics, prebiotics, symbiotics.

Mechanisms of regulation of pancreatic enzyme secretion. Exocrine function of the pancreas. Basic diseases of a pancreas, methods of diagnostics and treatment. Clinical pharmacology of enzyme and anti-enzyme drugs.

**Topic 28.** Clinical and pharmaceutical principles of choice insulin preparations. Clinical and pharmaceutical principles of choice of oral antidiabetic drugs.

Classification, etiopathogenesis of different types of diabetes. Classification of insulin preparations. Clinical pharmacology of insulin preparations. Complications of insulin therapy, their prevention and treatment are possible.

Clinical pharmacology of oral antidiabetic drugs (sulfonylureas, biguanides, thiazolidinediones, metglitinides, alpha-glucosidase inhibitors). Approaches to rational choice. Interaction of oral sugar-lowering drugs with drugs of other pharmacological groups. Features of use in the presence of concomitant pathology.

**Topic 29.** Pharmacotherapy of diabetic coma.

Complications of diabetes. Diabetic comas: classification, pathogenesis, principles of treatment. Clinical pharmacology of drugs used to treat diabetic com.

**Topic 30.** Clinical and pharmaceutical principles of the choice of drugs used to treat thyroid diseases.

Symptoms and syndromes in diseases of the thyroid gland. Methods of laboratory and instrumental diagnostics of thyroid diseases. Clinical pharmacology of thyroid hormone drugs, antithyroid drugs, iodine preparations.

**Topic 31.** Clinical and pharmaceutical principles for choosing of antiallergic drugs.

The concept of allergy. Classification of allergic conditions. Pathophysiology of type 1 and 2 allergic reactions. Symptoms and syndromes in allergies. Symptoms of an allergic nature that can be treated with OTC drugs. Clinical pharmacology of drugs used to treat allergies (glucocorticosteroids, antihistamine drugs, bronchodilators, stabilizers of membranous cell membranes, alpha- and beta-adrenergic receptor agonists). Side effects of anti-allergic drugs: prognosis, prevention, treatment.

**Topic 32.** Clinical and pharmaceutical principles of the choice of immunotropic drugs.

The concept of immunity. Physiology and pathophysiology of the immune response. Clinical pharmacology of drugs that suppress and stimulate immunity. Side effects of immunotropic drugs: prognosis, prevention, treatment.

**Topic 33.** Clinical and pharmaceutical principles of the choice of drugs that suppress CNS functions.

Classification of drugs that suppress CNS functions. Clinical pharmacology of drugs that suppress CNS functions (sedatives, tranquilizers, neuroleptics, hypnotics, anesthesia). Complications of therapy: their prevention and treatment.

**Topic 34.** Clinical and pharmaceutical principles of the choice of drugs that stimulate CNS functions.

Classification of drugs that stimulate CNS functions. Clinical pharmacology of drugs that stimulate CNS functions (antidepressants, psychostimulants, analeptics, actoprotectors, adaptogens, nootropics). Complications of therapy: their prevention and treatment.

**Topic 35.** General principles of antibacterial therapy. Spectra of antimicrobial activity of drugs. Classification of antibacterial drugs.

An algorithm for the choice of antimicrobial therapy for a particular patient. Classification of pathogens of infectious-inflammatory processes. Microbiological characteristics.

Modern classifications of antibacterial drugs depending on the spectrum of action, mechanism of action, type of action. Clinical significance in the choice of antimicrobial pharmacotherapy.

**Topic 36.** Possible complications of antibacterial therapy, their prevention and treatment.

General complications of antibacterial therapy. Viscerotoxicity. Immunobiological complications. Allergic reactions. Methods for controlling the safety of antibacterial therapy. Methods of prevention and treatment.

**Topic 37.** Clinical and pharmaceutical principles of antibiotic choice.

Classification of antibiotics. Clinical pharmacology of antibiotic groups (penicillins, cephalosporins, carbapenems, macrolides, aminoglycosides, glycopeptides, tetracyclines, amphenicols, polymyxins).

**Topic 38.** Clinico-pharmaceutical principles of the choice of sulfonamides. Complications of sulfanilamide therapy, their prevention and treatment.

Classification of sulfonamides. Antimicrobial action spectra. Current clinical aspects of application. Clinical pharmacology of sulfonamide preparations. Methods for monitoring the safety of sulfanilamides. Benefit-risk ratio when using sulfanilamides. The main side effects of drugs, methods of prevention and treatment.

**Topic 39.** Clinical and pharmaceutical principles of choice of oxyquinolines, fluoroquinolones.

The main preparations related to oxyquinolines, fluoroquinolones. Features of clinical pharmacology of these groups of antibacterial drugs. Modern possibilities of clinical application. Methods for evaluating the effectiveness and safety of their application.

**Topic 40.** Clinical and pharmaceutical principles of the choice of nitrofurans, nitroimidazoles.

Clinical pharmacology of nitrofurans, nitroimidazoles. Features of modern clinical application. Methods of control of efficiency and safety of their application.

**Topic 41.** Clinical and pharmaceutical principles of the choice of antiviral and antifungal drugs.

Clinical pharmacology of antiviral and antifungal drugs. Modern principles of clinical application. Methods and methods for monitoring efficiency and safety.

**Topic 42.** Principles of choice of drugs in anesthesiology and intensive care.

The concept of anesthesia and anesthesia. Types of anesthesia and anesthesia. Classification of drugs for anesthesia and anesthesia. Clinical pharmacology of general and local anesthetics. Methods of control of efficiency and safety of their application. The concept of resuscitation. Terminal states: their clinical characteristics. Types of resuscitation. Clinical pharmacology of drugs used in the emergency resuscitation service.

**Topic 43.** General principles of treatment of poisoning of drugs. Antidote therapy.

An algorithm for choosing pharmacotherapy for drug poisoning.

The concept of antidotes and antidote therapy. Classification of antidotes. Clinical pharmacology of the most common antidotes.

**Topic 44.** Pharmaceutical care: general principles and guidelines. Pharmaceutical care of patients with pathology of the cardiovascular system.

Definitions and basic concepts of pharmaceutical care. Relationship of the pharmacist (pharmacist) with the medical staff (doctor, nurse) during the pharmaceutical care. Algorithm of the action of the pharmacist in the proper pharmaceutical care of pharmacy / patient visitors during the dispensation of OTC drugs. Practical functions of the pharmacist, which are necessary for the care (method of collecting medical history. Development of a plan for monitoring the side effects of drugs, preventive actions).

The main symptoms in diseases of the cardiovascular system in which the use of OTC drugs is possible. "Threatening" symptoms in pathology of the cardiovascular system, in which medical intervention is required. Directions and means of symptomatic drug therapy in diseases of the cardiovascular system. Modern dosage forms for the treatment of symptoms and features of their use. Non-pharmacological methods of elimination of symptoms.

**Topic 45.** Pharmaceutical care of patients with respiratory tract pathology.

The main symptoms of diseases of the respiratory system in which the use of OTC drugs (cough, sore throat, fever, runny nose) is possible. "Threatening" symptoms in the pathology of the respiratory system, which require medical intervention. Directions and means of symptomatic drug therapy in diseases of the respiratory system. Modern dosage forms for the treatment of symptoms and features of their use. Non-pharmacological methods of elimination of symptoms.

**Topic 46.** Pharmaceutical care of patients with pathology of the gastrointestinal tract.

The main symptoms of diseases of the gastrointestinal tract, in which the use of OTC drugs (heartburn, constipation, diarrhea, flatulence, dysbiosis). "Threatening" symptoms in the pathology of the gastrointestinal tract, which require medical intervention. Directions and means of symptomatic drug therapy in diseases of the gastrointestinal tract. Modern dosage forms for the treatment of symptoms and features of their use. Non-pharmacological methods of elimination of symptoms.

**Topic 47.** Pharmaceutical care of patients with pathology of urinary tract. Pharmaceutical care of patients with superficial injuries.

The main symptoms of diseases of the urinary tract, in which the use of OTC drugs. "Threatening" symptoms in the pathology of the urinary tract, which require medical intervention. Directions and means of symptomatic drug therapy for diseases of the urinary tract. Modern dosage forms for the treatment of symptoms and features of their use. Non-pharmacological methods of elimination of symptoms.

The main symptoms of superficial injuries, which may be the use of OTC drugs. "Threatening" symptoms in traumas and skin lesions requiring medical intervention. Directions and remedies for symptomatic drug therapy in traumas and skin lesions. Modern dosage forms for the treatment of symptoms and features of their use. Non-pharmacological methods of elimination of symptoms.

**Topic 48.** Final topic.

**4. STRUCTURE OF THE STUDING DISCIPLINE**

Name of sections and topics of discipline	Amount of hours	
	Full-time study	
	In all	Including

		Lect	Pract. cl	Lab	Ind	IWS
Section 1						
Topic 1. Introduction to clinical pharmacy. The subject, tasks, basic principles of clinical pharmacy.	-	2	2	-	-	2
Topic 2. Basic methods of clinical examination of patients. Types of medical records. Medical history.	-	-	2	-	-	2
Topic 3. Clinical pharmacology: basic principles and provisions of the discipline. Fundamentals of clinical biopharmacy. Side effect of drugs. Pharmacovigilance system in Ukraine and in the World for the safety of drug use.	-	-	2	-	-	2
Section 2						
Topic 4. Clinico-pharmaceutical principles of the choice of bronchodilator drugs.	-	2	2	-	-	2
Topic 5. Clinical and pharmaceutical features of the choice of antimicrobial drugs in pulmonology.	-	2	2	-	-	2
Topic 6. Clinical and pharmaceutical principles of the choice of mucolytic, antihistamine, antitussive drugs.	-	-	2	-	-	-
Topic 7. Clinical and pharmaceutical principles of the choice of antihypertensive drugs.	-	2	4	-	-	2
Topic 8. Clinical and pharmaceutical principles of the choice of hypertensive drugs. Principles of treatment of hypertensive crises and acute hypotensive conditions.	-	-	4	-	-	2
Topic 9. Clinical and pharmaceutical approaches of the choice of antianginal and antiischemic drugs.	-	2	4	-	-	2
Topic 10. Clinico-pharmaceutical principles of choice of anticoagulants, antiplatelet agents, thrombolytics. Clinical and pharmaceutical approaches for the selection of lipid-lowering drugs.	-	-	2	-	-	2
Topic 11. Principles of treatment of angina pectoris, acute myocardial infarction.	-	-	2	-	-	-
Topic 12. Student research work: curation of patients, work with medical documentation,	-	-	4	-	-	2

review and discussion of medical prescriptions, clinical and pharmaceutical analysis.						
Topic 13. Clinical and pharmaceutical principles of the choice of cardiac glycosides and other positive cardiotonic agents.	-	2	4	-	-	2
Topic 14. Clinical and pharmaceutical principles of choice of diuretic drugs.	-	-	2	-	-	1
Topic 15. Clinical and pharmaceutical principles of choice of antiarrhythmic drugs.	-	-	2	-	-	1
Topic 16. Principles of treatment of cardiac asthma, pulmonary edema. Principles of treatment of urgent heart rhythm disorders.			2			-
Topic 17. Clinical and pharmaceutical principles of the choice of non-steroidal anti-inflammatory drugs.		2	4			2
Topic 18. Clinical and pharmaceutical principles of the choice of steroidal anti-inflammatory drugs (glucocorticosteroids).			2			2
Topic 19. Side effects of anti-inflammatory drugs: their prevention and treatment.		2	2			-
Topic 20. Protecting students' research work: quality, correctness, conformity of the writing scheme, validity of conclusions, oral defense.			4			2
Topic 21. Clinical and pharmaceutical principles of the choice of vitamins, drugs of metabolic type of action.			2			1
Topic 22. Clinical and pharmaceutical principles of choice of antianemic drugs. Clinico-pharmaceutical principles for the selection of hemostatics.		2	4			1
Topic 23. Clinical and pharmaceutical principles of the choice of antimicrobial drugs in urological practice.			2			-
Topic 24. Clinical and pharmaceutical principles of the choice of drugs for the treatment of urolithiasis. Clinical and pharmaceutical principles for the selection of drugs for the treatment of benign prostatic hyperplasia.			2			1
Topic 25. Clinical and pharmaceutical principles of choice of antisecretory drugs. Clinical and pharmaceutical principles of choice of antacids.		2	4			2

Topic 26. Clinical and pharmaceutical principles of the choice of hepatoprotectors. Clinical and pharmaceutical principles of choice of choleric, cholecinetics.	2	4			2
Topic 27. Clinical and pharmaceutical principles of the choice of drugs for use in hypoacid conditions and intestinal dysbiosis. Clinical and pharmaceutical principles of choice of enzyme and anti-enzyme drugs.		2			-
Topic 28. Clinical and pharmaceutical principles of choice insulin preparations. Clinical and pharmaceutical principles of choice of oral antidiabetic drugs.	2	4			2
Topic 29. Pharmacotherapy of diabetic coma.		2			-
Topic 30. Clinical and pharmaceutical principles of the choice of drugs used to treat thyroid diseases.		2			1
Topic 31. Clinical and pharmaceutical principles for choosing of antiallergic drugs.	2	2			2
Topic 32. Clinical and pharmaceutical principles of the choice of immunotropic drugs.		2			-
Topic 33. Clinical and pharmaceutical principles of the choice of drugs that suppress CNS function.		2			2
Topic 34. Clinical and pharmaceutical principles of the choice of drugs that stimulate CNS function.		2			-
Topic 35. General principles of antibacterial therapy. Spectra of antimicrobial activity of drugs. Classification of antibacterial drugs.	2	2			2
Topic 36. Possible complications of antibacterial therapy, their prevention and treatment.		2			-
Topic 37. Clinical and pharmaceutical principles of antibiotic choice.	2	4			2
Topic 38. Clinico-pharmaceutical principles of the choice of sulfonamides. Complications of sulfanilamide therapy, their prevention and treatment.		2			2
Topic 39. Clinical and pharmaceutical principles of choice of oxyquinolines, fluoroquinolones.		2			2

Topic 40. Clinical and pharmaceutical principles of the choice of nitrofurans, nitroimidazoles.			2			2
Topic 41. Clinical and pharmaceutical principles of the choice of antiviral and antifungal drugs.			2			2
Topic 42. Principles of choice of drugs in anesthesiology and intensive care.		2	2			1
Topic 43. General principles of treatment of poisoning of drugs. Antidote therapy.		2	2			-
Topic 44. Pharmaceutical care: general principles and guidelines. Pharmaceutical care of patients with pathology of the cardiovascular system.		2	2			2
Topic 45. Pharmaceutical care of patients with respiratory tract pathology.		2	2			2
Topic 46. Pharmaceutical care of patients with pathology of the gastrointestinal tract.		2	2			2
Topic 47. Pharmaceutical care of patients with pathology of urinary tract. Pharmaceutical care of patients with superficial injuries.			2			1
Topic 48. Final topic.			2			4
Topics of IWS – work in theme	-	-	-	-	-	8
In all hours in discipline	240	40	120	-	-	80

## 5. TOPICS OF LECTURES / SEMINARS / PRACTICAL / LABORATORY CLASSES

### 5.1. Full-time form of education

#### 5.1.1. Topics of lectures

<b>№</b>	<b>Theme</b>	<b>Amount of hours</b>
1.	Clinical pharmacy: introduction to discipline, subject, task, world development experience, relationships with others disciplines. Clinical pharmacology: basic principles and position.	2 (8 s.)
2.	Principles of clinical-pharmaceutical approach to the choice of drugs for the treatment of respiratory diseases (bronchial asthma, COPD, infectious diseases).	2 (8 s.)

3.	Principles of clinical-pharmaceutical approach to the choice of drugs for the treatment of hypertension (essential and asymptomatic).	2 (8 s.)
4.	Principles of clinical-pharmaceutical approach to the choice of drugs for the treatment of coronary heart disease, atherosclerosis, heart failure.	2 (8 s.)
5.	Principles of clinical-pharmaceutical approach to the choice of drugs in rheumatology practice. Pain: pathophysiological aspects of pharmacotherapy.	2 (8 s.)
6.	Principles of clinical-pharmaceutical approach to the choice of drugs for the treatment of diseases of the digestive system (peptic ulcer, GERD, bowel disease).	2 (8 s.)
7.	Principles of clinical-pharmaceutical approach to the choice of drugs for the treatment of diseases of the organs of the hepatobiliary system.	2 (8 s.)
8.	Principles of clinical and pharmaceutical approach to the choice of drugs for the treatment of diseases of the urinary system and blood system.	2 (8 s.)
9.	Principles of clinical and pharmaceutical approach to the choice of drugs for the treatment of diseases of the endocrine system (diabetes, thyroid disease).	2 (8 s.)
10.	Principles of clinical-pharmaceutical approach to the choice of drugs for the treatment of allergic diseases.	2 (8 s.)
11.	Principles of clinical-pharmaceutical approach to the choice of drugs for the treatment of infectious diseases.	2 (9 s.)
12.	Antibiotics: clinical pharmacology of modern groups of antibiotics.	2 (9 s.)
13.	Neurosis and stress: principles of drug selection.	2 (9 s.)
14.	Pharmaceutical care: definitions, general principles, role of pharmacist in the implementation of pharmaceutical care.	2 (9 s.)
15.	Side effects of drugs: prevention and treatment. General principles of treatment of acute drug poisoning.	2 (9 s.)
16.	The influence of drugs on the change of clinical and laboratory and functional indicators.	2 (9 s.)
17.	Pulmonary and extrapulmonary tuberculosis: etiology, pathogenesis, clinical pharmacology of drugs with	2 (9 s.)

	antituberculosis activity.	
18.	The role of the pharmacist in conducting preclinical and clinical trials of new drugs.	2 (9 s.)
19.	Drug interaction. The interaction of drugs and food.	2 (9 s.)
20.	Pharmacoeconomics: definition, basic principles and concepts. Evidence-based medicine and pharmacology. Formular system.	2 (9 s.)
	In all	<b>40</b>

### 5.1.2. Topics of seminar classes - seminars are not provided.

### 5.1.3. Topics of practical classes

<b>№</b>	<b>THEME</b>	<b>Amount of hours</b>
1.	Topic 1. Practical class 1. Introduction to clinical pharmacy. The subject, tasks, basic principles of clinical pharmacy.	2 (8 s.)
2.	Topic 2. Practical class 2. Basic methods of clinical examination of patients. Types of medical records. Medical history.	2 (8 s.)
3.	Topic 3. Practical class 3. Clinical Pharmacology: basic principles and regulations. Fundamentals of clinical biopharmacy. Side effect of drugs. Pharmacovigilance system for medication safety.	2 (8 cs)
4.	Topic 4. Practical class 4. Clinico-pharmaceutical principles for the choice of bronchodilator drugs.	2 (8 s.)
5.	Topic 5. Practical class 5. Clinical and pharmaceutical features of the choice of antimicrobial drugs in pulmonology.	2 (8 s.)
6.	Topic 6. Practical class 6. Clinical and pharmaceutical principles for the choice of mucolytic, antihistamine, antitussive drugs.	2 (8 s.)
7.	Topic 7. Practical class 7 1. Clinical and pharmaceutical principles of choice of antihypertensive drugs.	2 (8 s.)
8.	Topic 7. Practical class 7 2. Clinical and pharmaceutical principles of choice of antihypertensive drugs.	2 (8 s.)
9.	Topic 8. Practical class 8 1. Clinical and pharmaceutical principles of choice of hypertensive drugs.	2 (8 s.)
10.	Topic 8. Practical class 8 2. Principles of treatment of hypertensive crises and acute hypotensive conditions.	2 (8 s.)

11.	Topic 9. Practical class 9 1. Clinical and pharmaceutical principles of choice of antianginal drugs.	2 (8 s.)
12.	Topic 9. Practical class 9 2. Clinical and pharmaceutical principles of choice of antiischemic drugs.	2 (8 s.)
13.	Topic 10. Practical class 10. Clinical and pharmaceutical principles of choice of anticoagulants, antiplatelet agents, thrombolytics. Clinical and pharmaceutical approaches for the choice of hypocholesterol drugs.	2 (8 s.)
14.	Topic 11. Practical class 11. Principles of treatment of angina athac, acute myocardial infarction.	2 (8 s.)
15.	Topic 12. Practical class 12 1. Educational and research work of students: supervision of patients, work with medical documentation, review and discussion of medical prescriptions.	2 (8 s.)
16.	Topic 12. Practical class 12 2. Clinical and pharmacological analysis.	2 (8 s.)
17.	Topic 13. Practical class 13 1. Clinical and pharmaceutical principles of choice of cardiac glycosides.	2 (8 s.)
18.	Topic 13. Practical class 13 2. Clinical and pharmaceutical principles of choice of njn-glycoside positive cardiotonic agents.	2 (8 s.)
19.	Topic 14. Practical class 14. Clinical and pharmaceutical principles of choice of diuretic drugs.	2 (8 s.)
20.	Topic 15. Practical class 15. Clinical and pharmaceutical principles of choice of antiarrhythmic drugs.	2 (8 s.)
21.	Topic 16. Practical class 16. Principles of treatment of cardiac asthma, pulmonary edema. Principles of treatment of urgent heart rhythm disorders.	2 (8 s.)
22.	Topic 17. Practical class 17 1. Clinical and pharmaceutical principles of choice of non-steroidal anti-inflammatory drugs.	2 (8 s.)
23.	Topic 17. Practical class 17 2. Clinical and pharmaceutical principles of choice of non-steroidal anti-inflammatory drugs.	2 (8 s.)
24.	Topic 18. Practical class 18. Clinical and pharmaceutical principles of choice of steroidal anti-inflammatory drugs (glucocorticosteroids).	2 (8 s.)
25.	Topic 19. Practical class 19. Side effects of anti-inflammatory drugs: their prevention and treatment.	2 (8 s.)
26.	Topic 20. Practical class 20 1. Protection of EDRS of students.	2 (8 s.)
27.	Topic 20. Practical class 20 2. Protection of EDRS of students.	2 (8 s.)

28.	Topic 21. Practical class 21. Clinical and pharmaceutical principles of choice of vitamins, drugs of metabolic type of action.	2 (8 s.)
29.	Topic 22. Practical class 22 1. Clinical and pharmaceutical principles of choice of antianemic drugs.	2 (8 s.)
30.	Topic 22. Practical class 22 2. Clinical and pharmaceutical principles for the choice of hemostatics.	2 (8 s.)
31.	Topic 23. Practical class 23. Clinical and pharmaceutical principles of choice of antimicrobial drugs in urological practice.	2 (8 s.)
32.	Topic 24. Practical class 24. Clinical and pharmaceutical principles for the choice of drugs for the treatment of urolithiasis. Clinical and pharmaceutical principles for the choice of drugs for the treatment of benign prostatic hyperplasia.	2 (8 s.)
33.	Topic 25. Practical class 25 1. Clinical and pharmaceutical principles of choice of antisecretory drugs.	2 (8 s.)
34.	Topic 25. Practical class 25 2. Clinical and pharmaceutical principles of choice of antacids.	2 (8 s.)
35.	Topic 26. Practical class 26 1. Clinical and pharmaceutical principles of choice of hepatoprotectors.	2 (8 s.)
36.	Topic 26. Practical class 26 2. Clinical and pharmaceutical principles of choice of choleric, cholekinetics.	2 (8 s.)
37.	Topic 27. Practical class 27. Clinical and pharmaceutical principles of choice of enzyme and anti-enzyme drugs. Clinical and pharmaceutical principles of choice of drugs, which are prescribed for hypoacid conditions, intestinal dysbiosis.	2 (8 s.)
38.	Topic 28. Practical class 28 1. Clinical and pharmaceutical principles of choice of insulin preparations.	2 (8 s.)
39.	Topic 28. Practical class 28 2. Clinical and pharmaceutical principles of choice of oral antidiabetic drugs.	2 (8 s.)
40.	Topic 29. Practical class 29. Pharmacotherapy of diabetic coma.	2 (8 s.)
41.	Topic 30. Practical class 30. Clinical and pharmaceutical principles of the choice of drugs used to treat thyroid diseases.	2 (9 s.)
42.	Topic 31. Practical class 31. Clinical and pharmaceutical principles of choice of antiallergic drugs.	2 (9 s.)
43.	Topic 32. Practical class 32. Clinical and pharmaceutical principles for the choice of immunotropic drugs.	2 (9 s.)

44.	Topic 33. Practical class 33. Clinical and pharmaceutical principles for the choice of drugs that suppress CNS functions.	2 (9 s.)
45.	Topic 34. Practical class 34. Clinical and pharmaceutical principles for the choice of drugs that stimulate CNS functions.	2 (9 s.)
46.	Topic 35. Practical class 35. General principles of antibacterial therapy. Spectra of antimicrobial activity of drugs. Classification of antibacterial drugs.	2 (9 s.)
47.	Topic 36. Practical class 36. Possible complications of antibacterial therapy, their prevention and treatment.	2 (9 s.)
48.	Topic 37. Practical class 37 1. Clinical and pharmaceutical principles of choice of antibiotic beta-lactame group.	2 (9 s.)
49.	Topic 37. Practical class 37 2. Clinical and pharmaceutical principles of choice of antibiotics other chemical groups.	2 (9 s.)
50.	Topic 38. Practical class 38. Clinico-pharmaceutical principles for the choice of sulfonamides. Complications of sulfanilamide therapy, their prevention and treatment.	2 (9 s.)
51.	Topic 39. Practical class 39. Clinical and pharmaceutical principles of choice of oxyquinolines, fluoroquinolones.	2 (9 s.)
52.	Topic 40. Practical class 40. Clinical and pharmaceutical principles of choice of nitrofurans, nitroimidazoles.	2 (9 s.)
53.	Topic 41. Practical class 41. Clinical and pharmaceutical principles of choice of antiviral and antifungal drugs.	2 (9 s.)
54.	Topic 42. Practical class 42. Principles of choice of drugs in anesthesiology and intensive care.	2 (9 s.)
55.	Topic 43. Practical class 43. General principles of treatment of poisoning by drugs. Antidote therapy.	2 (9 s.)
56.	Topic 44. Practical class 44. Pharmaceutical care: general principles and regulations. Pharmaceutical care of patients with pathology of the cardiovascular system.	2 (9 s.)
57.	Topic 45. Practical class 45. Pharmaceutical care of patients with respiratory tract pathology.	2 (9 s.)
58.	Topic 46. Practical class 46. Pharmaceutical care of patients with gastrointestinal tract pathology.	2 (9 s.)
59.	Topic 47. Practical class 47. Pharmaceutical care of patients with pathology of urinary tract. Pharmaceutical care of patients with	2 (9 s.)

	superficial injuries.	
60.	Practical class 48. Final topic.	2 (9 s.)
	<b>In all</b>	<b>120</b>

#### 5.4. Topics of laboratory classes - laboratory classes are not provided

### 6. INDEPENDENT WORK OF A HIGHER EDUCATION STUDENT

#### 6.1. Full-time form of education

<b>№</b>	<b>Theme</b>	<b>Amount of hours</b>
1.	Training for practical classes - theoretical training.	60
2.	To work out topics that are not included in the lesson plan: - Clinical pharmacogenetics; -Clinico-pharmaceutical principles for the choice of drugs that affect the tone of blood vessels and blood circulation; -Clinico-pharmaceutical principles of choice of basic anti-inflammatory drugs and correctors of metabolism of connective tissue and articular cartilage; -Clinico-pharmaceutical principles of choice of drugs that enhance and suppress hematopoiesis; -Modern methods of contraception. Clinical and pharmaceutical principles of contraceptive selection; -Interaction of drugs.	12
3.	Preparation and writing of the "Protocol of study of pharmacodynamics of drugs".	4
4.	Training for final topic.	4
	<b>In all</b>	<b>80</b>

### 7. FORMS AND METHODS OF TEACHING

#### Forms of teaching:

The discipline is taught in the form of lectures, practical classes; organization of independent

work of the applicant.

### **Methods of teaching:**

Practical classes: conversation, role-playing games, solving situational problems, solving test problems.

Independent work: independent work with the textbook, independent work with the recommended basic and additional literature, with electronic information resources, independent solving of clinical problems.

## **8. FORMS OF CONTROL AND CRITERIA FOR ASSESSING LEARNING RESULTS**

**Forms of current control:** oral interview, testing, assessment of practical skills, assessment of communication skills during a role-playing game, solving situational problems, assessment of activity in the lesson.

**Form of final control:** exam.

The exam is a form of final control that takes place as a separate control event. Exams are taken by examiners who are approved at the department meeting and submitted to the University's educational department.

Exams are taken by applicants: during the examination sessions at the end of the autumn semester according to the schedule. The methodology of final control of the educational component in the form of an exam is unified and involves the use of standardized forms.

### **Criteria for assessing the learning outcomes of higher education applicants during current control**

#### **Evaluation criteria**

"5" The applicant actively participates in the discussion of the most difficult questions on the topic of the lesson, gives at least 90% correct answers to standardized test tasks, answers written tasks without errors, performs practical work and draws up a protocol.

"4" The applicant participates in the discussion of the most difficult questions on the topic, gives at least 75% correct answers to standardized test tasks, makes some minor mistakes in the answers to written tasks, performs practical work and draws up a protocol.

"3" The applicant participates in the discussion of the most difficult questions on the topic, gives at least 60% correct answers to standardized test tasks, makes significant mistakes in answers to written tasks, performs practical work and draws up a protocol.

"2" The applicant does not participate in the discussion of complex questions on the topic, gives less than 60% correct answers to standardized test tasks, makes gross mistakes in answers to written tasks or does not give answers to them at all, does not perform practical work and does not draw up a protocol.

Only those applicants who have fulfilled the requirements of the training program in the discipline, have no academic debt, their average score for the current educational activity in the discipline is at least 3.00, and they have passed the test control according to the tests "Krok - 2"

are admitted to the final control in the form of an exam. » at least 90% (50 tasks).

The test control is conducted in the Educational and Production Complex of Innovative Technologies of Learning, Informatization and Internal Monitoring of the Quality of Education of the University in the last class before the exam.

### **Criteria for evaluating the results of the students' training during final control – exam**

#### **Evaluation criteria**

Excellent "5" The applicant worked systematically during the semester, showed versatile and deep knowledge of the program material during the exam, is able to successfully perform the tasks provided for in the program, mastered the content of the main and additional literature, realized the interrelationship of individual sections of the discipline, their importance for the future profession, showed creative abilities in understanding and using educational program material, showed the ability to independently update and replenish knowledge; the level of competence is high (creative);

Good "4" The applicant has demonstrated full knowledge of the educational program material, successfully performs the tasks provided for by the program, has mastered the basic literature recommended by the program, has shown a sufficient level of knowledge in the discipline and is capable of their independent updating and renewal in the course of further training and professional activity; the level of competence is sufficient (constructive and variable)

Satisfactory "3" The applicant who demonstrated knowledge of the main curriculum material in the amount necessary for further education and subsequent work in the profession, copes with the tasks provided for by the program, made some mistakes in the answers on the exam and when completing the exam tasks, but has the necessary knowledge to overcome mistakes made under the guidance of a scientific and pedagogical worker; level of competence - average (reproductive)

Unsatisfactory "2" The applicant did not demonstrate sufficient knowledge of the main educational program material, made fundamental mistakes in the performance of tasks provided for by the program, cannot use the knowledge in further studies without the help of a teacher, did not manage to master the skills of independent work; the level of competence is low (receptive-productive)

### **9. Distribution of points received by applicants for higher education**

The obtained average score for the academic discipline for applicants who have successfully mastered the work program of the academic discipline is converted from a traditional four-point scale to points on a 200-point scale, as shown in the table:

Conversion table of a traditional assessment into a multi-point scale

Traditional four-point scale Multi-point 200-point scale

Excellent ("5") 185 - 200

Good ("4") 151 - 184

Satisfactory ("3") 120-150

Unsatisfactory ("2") Below 120

A multi-point scale (200-point scale) characterizes the actual success rate of each applicant

in mastering the educational component. The conversion of the traditional grade (average score for the academic discipline) into a 200-point grade is performed by the information and technical department of the University.

According to the obtained points on a 200-point scale, the achievements of the applicants are evaluated according to the ECTS rating scale. Further ranking according to the ECTS rating scale allows you to evaluate the achievements of students from the educational component who are studying in the same course of the same specialty, according to the points they received.

The ECTS scale is a relative-comparative rating, which establishes the applicant's belonging to the group of better or worse among the reference group of fellow students (faculty, specialty). An "A" grade on the ECTS scale cannot be equal to an "excellent" grade, a "B" grade to a "good" grade, etc. When converting from a multi-point scale, the limits of grades "A", "B", "C", "D", "E" according to the ECTS scale do not coincide with the limits of grades "5", "4", "3" according to the traditional scale. Acquirers who have received grades of "FX" and "F" ("2") are not included in the list of ranked acquirers. The grade "FX" is awarded to students who have obtained the minimum number of points for the current learning activity, but who have not passed the final examination. A grade of "F" is assigned to students who have attended all classes in the discipline, but have not achieved a grade point average (3.00) for the current academic activity and are not admitted to the final examination.

Applicants who study in one course (one specialty), based on the number of points scored in the discipline, are ranked on the ECTS scale as follows:

Conversion of the traditional grade from the discipline and the sum of points on the ECTS scale

Evaluation on the ECTS scale Statistical indicator

- A The best 10% of achievers
- B The next 25% of applicants
- C The next 30% of applicants
- D The next 25% of earners
- E The next 10% of earners

## **10. METHODOLOGICAL SUPPORT**

- Syllabus of the academic discipline
- Working program of the academic discipline
- Methodological recommendations for lectures
- Methodological recommendations for practical classes
- Methodological recommendations for independent work of higher education applicants
- Multimedia presentations
- Illustrative materials
- Situational tasks
- Database of test tasks

## 11. List of questions for the exam

1. The subject, tasks and main directions of clinical pharmacy.
2. Basic clinical methods of examination of the patient and their importance for the pharmacist.
3. Medical documentation. Medical history.
4. Clinical aspects of biopharmacy.
5. Pharmacodynamics of drugs.
6. Pharmacokinetics of drugs.
7. The main side effects of applying drugs.
8. Worldwide experience in drug safety monitoring - pharmacovigilance system in Ukraine and the world.
9. Factors affecting the clinical efficacy of drugs.
10. Clinical pharmacogenetics.
11. Principles of clinical-pharmaceutical approach to the choice of medicines, used in respiratory diseases.
12. Clinical pharmacology of mucolytic drugs.
13. Clinical pharmacology of expectorants.
14. Clinical pharmacology of central and cough remedies peripheral action.
15. Clinical pharmacology of beta-adrenoceptor stimulators.
16. Clinical pharmacology of M-cholinoblockers with bronchodilator activity.
17. Principles of selection and administration of antimicrobial drugs in pulmonology.
18. Principles of clinical-pharmaceutical approach to the choice of medicines for the treatment of coronary heart disease.
19. Clinical pharmacology of calcium channel blockers.
20. Clinical pharmacology of antiplatelet drugs.
21. Clinical pharmacology of beta-blockers.
22. Clinical pharmacology of nitrates.
23. Clinical pharmacology of hypolipidemic drugs.
24. Principles of treatment of acute myocardial infarction.
25. Principles of clinical-pharmaceutical approach to the choice of medicines for the treatment of acute heart failure.

26. Principles of clinical-pharmaceutical approach to the choice of medicines for the treatment of chronic heart failure.
27. Clinical pharmacology of cardiac glycosides.
28. Non-glycosidic cardiotonic drugs, features of pharmacodynamics and clinical use.
29. Principles of clinical-pharmaceutical approach to the choice of drugs for the treatment of hypertension.
30. Principles of clinical-pharmaceutical approach to the choice of medicines for the treatment of hypertensive crises.
31. Clinical pharmacology of diuretic drugs for the treatment of hypertension.
32. Clinical pharmacology of methylxanthine derivatives.
33. Clinical pharmacology of angiotensin converting enzyme inhibitors.
34. Clinical pharmacology of angiotensin receptor antagonists 2.
35. Principles of clinical-pharmaceutical approach to the choice of medicines for the treatment of acute hypotonic conditions.
36. Principles of choosing drugs for the treatment of arterial hypotension.
37. Clinical pharmacology of sympathomimetics.
38. Principles of clinical-pharmaceutical approach to the choice of medicines for the treatment of bradyarrhythmias.
39. Principles of clinical-pharmaceutical approach to the choice of medicines for the treatment of tachycardia disorders of the heart rhythm.
40. Clinical pharmacology of anticoagulants.
41. Principles of clinical-pharmaceutical approach to the choice of anti-inflammatory drugs.
42. Clinical pharmacology of glucocorticosteroids.
43. Clinical pharmacology of connective tissue metabolism correctors.
44. Clinical pharmacology of non-steroidal anti-inflammatory drugs.
45. The main side effects of nonsteroidal anti-inflammatory drugs, methods of prevention and treatment.
46. The main side effects of glucocorticosteroids, their prevention and treatment.
47. Agents for basic anti-inflammatory therapy: features of pharmacodynamics and clinical use.
48. Principles of clinical-pharmaceutical approach to the choice of medicines for the treatment of diseases of the gastrointestinal tract.

49. Principles of clinical-pharmaceutical approach to the choice of medicines for the treatment of diseases of the hepatobiliary system.
50. Clinical pharmacology of antacid drugs.
51. Clinical pharmacology of H<sub>2</sub>-histamine receptor blockers.
52. Clinical pharmacology of proton pump inhibitors.
53. Clinical pharmacology of M-cholin blockers.
54. Clinical pharmacology of hepatoprotectors.
55. Clinical pharmacology of cholergics and cholecinetics.
56. Clinical pharmacology of enzyme preparations.
57. Clinical pharmacology of anti-enzyme preparations.
58. Principles of the clinical-pharmaceutical approach to the choice of medicines for the treatment of diseases of the urinary organs.
59. Clinical pharmacology of oxyquinoline derivatives.
60. Clinical pharmacology of fluoroquinolones.
61. Clinical pharmacology of sulfonamides.
62. Clinical pharmacology of nitrofurans.
63. Clinical pharmacology of nitroimidazoles.
64. Principles of clinical-pharmaceutical approach to the choice of medicines for the treatment of diseases of the blood system.
65. Clinical pharmacology of hemostatics.
66. Clinical pharmacology of iron preparations.
67. Principles of clinical-pharmaceutical approach to the choice of anti-allergic medicines.
68. Clinical pharmacology of mast cell membrane stabilizers.
69. Clinical pharmacology of antihistamines.
70. Principles of clinical-pharmaceutical approach to the choice of antimicrobial drugs.
71. The main side effects of antimicrobial drugs are:  
their prevention and treatment.
72. Clinical pharmacology of antibiotics of the penicillin group.
73. Clinical pharmacology of aminoglycosides.
74. Clinical pharmacology of cephalosporins.

75. Clinical pharmacology of macrolides.
76. Clinical pharmacology of tetracyclines.
77. Clinical pharmacology of the chloramphenicol group.
78. Clinical pharmacology of antibiotics of carbapenem and glycopeptide groups.
79. Principles of clinical-pharmaceutical approach to the choice of antiviral medicines.
80. Principles of clinical-pharmaceutical approach to the choice of antifungal medicines.
81. Principles of clinical-pharmaceutical approach to psychotropic choice drugs that suppress the central nervous system.
82. Principles of clinical-pharmaceutical approach to psychotropic choice drugs that stimulate the central nervous system.
83. Clinical pharmacology of vitamins.
84. Clinical pharmacology of insulin preparations.
85. Clinical pharmacology of oral antidiabetic agents.
86. Principles of treatment of hyperglycemic diabetic com.
87. Principles of treatment of hypoglycemic diabetic coma.
88. Clinical pharmacology of antithyroid drugs.
89. Clinical pharmacology of thyroid hormone preparations.
90. Principles of clinical-pharmaceutical approach to treatment of acute drug poisoning.
91. Pharmaceutical interaction of drugs.
92. Pharmacological interaction of drugs.
93. Pharmaceutical care: general principles and guidelines.
94. Pharmaceutical care of patients with respiratory tract pathology.
95. Pharmaceutical care of patients with pathology of digestive organs.
96. Pharmaceutical care of patients with pathology of the cardiovascular system.
97. Current principles and examples of classifications of antimicrobial drugs.
98. Antidote therapy: definitions, principles for classification of antidotes, examples of clinical use.

## **12. Recommended literature:**

### **Basic:**

- 1) Betram G Katzung Basic and Clinical Pharmacology, 14th Edition. - McGraw-Hill Medical, 2018.- 1235 p.
- 2) Godovan V.V. Pharmacology in pictures and schemes. – Nova Knyha, 2021. - 464 p.
- 3) Clinical pharmacology: Manual for practical classes. – 2-nd edition / Edited by O.V.Kraydashenko. – Vinnytsya: Nova Khyna Publishers, 2010. – 192 p.
- 4) T.R.Harrison and others Harrison’s principles of internal medicine, 19 th edition (Vols 1&2). – McGraw Hill education, 2015. – 3983 p.
- 5) Craham Douglas, Fiona Nicol, Colin Robertson Macleod’s clinical Examination, 13 th edition. – Churchill Livingstone, 2013. – 471 p.

**Additional:**

- 1) Emergency management of internal diseases / Edited by O.Babak and O.Bilovol. – Kyiv: AUS Medicine Publishing, 2010. – 448 p.
- 2) EDUCATIONAL AND METHODOICAL MANUAL to practical training in clinical pharmacy for the students of pharmaceutical faculty / Strechen S.B., Tregub T.V., Poludenko A.A., Rzhevskaya Yu.I. – Odessa, 2023.- Part I – 665 p., Part II – 732 p.
- 3) Клініко-фармакологічний глосарій: навч. посібник / В.Й.Кресюн, В.В.Годован, С.Б.Стречень. – Одеса: ОНМедУ, 2015. – 328 с.

**13. Electronic information resources:**

1. Resources for predicting inter-drug interactions (based on FDA instructions, in English) URL: <http://www.drugs.com>
2. Resource-Directory of Medicines and Forecasting of Intercurricular Interactions (in English). URL: <http://www.medscape.org>
3. Interregional Society of Evidence-Based Medicine: <http://www.osdm.org/index.php>
4. Bulletin of Evidence-Based Medicine: <http://www.evidence-update.ru>
5. European Society of Clinical Pharmacologists and Pharmacists: <http://www.eacpt.org>
6. Resources for drug interactions: <http://medicine.iupui.edu/flockart/>