

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

Department of Pharmacy Organization and Economy
with post-diploma specialization

APPROVED
Vice-rector for scientific and pedagogical work

Eduard BURYACHKIVSKY
September 1st, 2024



WORK PROGRAM IN THE DISCIPLINE

PHARMACEUTICAL AND MEDICAL COMMODITY SCIENCE

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

Field of knowledge: 22 "Health care"

Specialty: 226 "Pharmacy, industrial Pharmacy"

Educational and professional program: "Pharmacy, industrial pharmacy"

The working program is compiled on the basis of the educational and professional program "Pharmacy, industrial pharmacy" for the training of specialists of the second (master's) level of higher education in the specialty 226 "Pharmacy, industrial pharmacy" of the field of knowledge 22 "Health care", approved by the Academic Council of ONMedU (minutes No. 10 dated 27/06/2024).

Authors:

Senior teacher Oksana STEPANOVA

Doctor of Pharm. Sc., Prof. Liana UNHURIAN

PhD in Pharmacy, Assoc. prof. Oksana BIELIAIEVA

Senior teacher Iryna YASHCHUK

The working program was approved at the meeting of the Department of Pharmacy Organization and Economy with post-diploma specialization
Minutes No. 1 dated August 29, 2024.

Head of the department



Oksana BIELIAIEVA

(signature) (First Name Surname)

Approved by the guarantor of
the educational and professional program



Liana UNHURIAN

(signature) (First Name Surname)

Approved by the subject cycle methodical commission for pharmaceutical disciplines of ONMedU
Minutes No. 1 dated August 30, 2024.

Head of the subject cycle methodical commission

for pharmacy's disciplines of ONMed



Natalia FIZOR

(signature) (First Name Surname)

Revised and approved at the meeting of the department _____

Minutes No. ___ of "___" _____ 20__

Head of Department _____

(signature) (First Name Surname)

Revised and approved at the meeting of the department _____

Minutes No. ___ of "___" _____ 20__

Head of Department _____

(signature) (First Name Surname)

1. Description of the Discipline:

Name of indicators	Field of knowledge, specialty, specialization, level of higher education	Characteristics of the discipline
The total number of: Credits: 5.0 Hours: 150 Content modules: 2	Branch of knowledge <u>22 "Health care"</u>	Full-time education, compulsory discipline
	Specialty <u>226 "Pharmacy, industrial pharmacy"</u>	Year of training: 4
		Semesters VII-VIII
		Lectures (30 hours)
	Level of higher education <u>second (master's degree)</u>	Seminars (0 hours)
		Practical (70 hours)
		Laboratory (0 hours)
		Independent work (50 hours)
		<i>Final control - graded test</i>

2. The Purpose and Objectives of the Discipline, Competencies, and Program Learning Outcomes.

Purpose: mastering by the student of higher education knowledge and formation of elements of professional competences in the field of pharmacy and improvement of skills and competences acquired during the study of previous disciplines.

Objectives:

1. Formation of abilities and skills of conducting merchandising operations related to the provision of medical and preventive institutions and the population with medicinal products and medical products
2. Formation of abilities and skills in handling medical instruments, devices and equipment used for diagnosing diseases
3. Creation of an appropriate knowledge base that determines the professional competence and general erudition of pharmacists.

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

- **General (GC):**

GC 02. Knowledge and understanding of the subject area and understanding of professional activity.

GC 09. Ability to use information and communication technologies.

GC 11. Ability to apply knowledge in practical situations

- **Special (SC):**

SC 04. 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.

SC 08. 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.

SC 12. Ability to ensure proper storage of medicinal products of natural and synthetic origin and other products of the pharmacy assortment in accordance with their physicochemical properties and the rules of Good Storage Practice (GSP) in health care institutions.

SC 13. The ability to organize the activities of the pharmacy to supply the population, health care facilities 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.

SC 24. Ability to use knowledge of regulatory and legal acts of Ukraine and recommendations of appropriate pharmaceutical practices in professional activities.

Program learning outcomes (PLO):

PLO N03. 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.

PLO 11. 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.

PLO 15. Predict and determine the influence of environmental factors on the quality and consumer characteristics of medicinal products of natural and synthetic origin and other products of the pharmacy assortment, organize their storage in accordance with their physical and chemical properties and the rules of Good Storage Practice (GSP).

PLO 36. Plan and implement professional activities on the basis of normative legal acts of Ukraine and recommendations of proper pharmaceutical practices

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

- **know:**

- principles and levels of standardization, types of standards;
- designation of regulatory documentation;
- main classification approaches to pharmacy assortment products;
- basic concepts and principles of quality management;
- the procedure for state registration in Ukraine of medicines, medical products, special food products and other pharmacy goods;
- key differences in the merchandising characteristics of certain groups of pharmacy goods;
- regulatory documents regulating the circulation of medicines and medical devices in Ukraine;
- rules of rational storage and transportation of medical and pharmaceutical goods;
- algorithms of pharmaceutical care when dispensing medical products and related pharmaceutical products from pharmacies;

- **be able to:**

- conduct a commodity analysis of the pharmacy assortment of goods;
- accept the goods and provide an assessment of its quality;
- check the correctness of the labeling of finished medicines and medical products;
- distribute the received goods by storage departments;
- carry out incoming quality control of medicines and medical devices to detect falsified and substandard products of the pharmacy assortment;
- create and control proper storage and transportation conditions for pharmaceutical products.

3. Content of the Discipline

Content module 1. Basics of commodity science. Commodity analysis of medical products and finished medicines. Packaging, labeling.

Topic 1. Fundamentals of commodity science. Normative documentation in the pharmaceutical industry.

The concept of a product and its consumer value. Definition of the terms "goods", "assortment of goods". The quality of goods as the main category of commodity science. The emergence and development of commodity science. Subject of commodity studies. The purpose and tasks of commodity science in the system of training pharmacists at the current stage of pharmacy development. Integration of commodity

science with other disciplines. Definition of the term "standardization". Principles, levels, subjects and objects of standardization. The main goals and tasks of standardization. Definition of the term "standard". Types of standards. Designation of regulatory documentation (ND). Structural elements of the national standard, quality control methods (QQM). Rules of construction and presentation of technical conditions (TU). Requirements for marking standards and technical conditions. Procedure for approval and term of validity of regulatory documentation. Certification. Technical regulations and conformity assessment of medical devices. Registration of medicines.

Topic 2 Classification and coding of goods.

The concept of product classification and its categories. Purpose, purpose, signs and general rules of classification. Types of product classification. Product coding systems. Coding system in the commodity nomenclature of foreign economic activity (TN ZED). Bar coding.

Topic 3. Fundamentals of commodity analysis of pharmacy products.

Definition of the terms "analysis", commodity analysis", "expertise", commodity expertise". Functions, goals and tasks of commodity analysis. Peculiarities of commodity analysis of medical and pharmaceutical products. The main stages of commodity analysis. Requirements for medical and pharmaceutical products. The main properties of materials (physical, chemical, technological, etc.) that ensure the quality of goods. The concept of merchandising operations, their classification and characteristics. Acceptance and release of goods, quality assessment, organization of storage and transportation. The process of movement of goods in the pharmacy network and commercial transactions related to it. The procedure for drawing up contracts with suppliers of medical and pharmaceutical goods. Classification of medical products depending on storage conditions: according to physical and chemical properties, method of application, expiration date, types and methods of packaging. and organoleptic quality indicators, requirements for the quality of medical products.

Topic 4. Packaging and labeling of medical products. Packaging and its functional purpose. Packaging properties. Assortment of consumer packaging for medical products Marking of consumer packaging of medical products. Information signs on the packaging of medical products. Marking structure. DSTU EN ISO 15223-1:2022 "Medical products. Symbols used during marking on medical products, labels and accompanying documentation". Requirements for labeling medical devices depending on the safety class.

Topic 5. Packaging, labeling of finished medicines. Closers.

Classification of pharmaceuticals depending on the storage conditions: by pharmacological action, physicochemical properties, method of application, expiration date, method of obtaining, aggregate state, types and methods of packaging and organoleptic quality indicators, requirements for the quality of dosage forms. Packaging and its functional purpose. Classification of pharmaceutical packaging (primary, secondary, group, consumer and transport) packaging properties. Packaging, labeling and transportation of drugs. Concepts of "container", "container for pharmaceutical use" and "packaging". Classification of sealing means by definition, design features, fastening methods, materials, production methods. Requirements for sealing means (general, special and sanitary and hygienic). Storage. Packaging materials and requirements for them. Classification, assortment. Storage of packaging materials.

Topic 6. Commodity analysis of transport containers.

Classification of containers. Requirements for containers for pharmaceutical use. Assortment of consumer packaging. Glass, metal and polymer containers and their technical requirements. Cardboard packaging and technical requirements for it. Types of transport containers and their purpose. Marking of transport containers. Basic technical requirements for transport containers. Container storage. Organization of packaging industry. Organization of container circulation (multi-turn container, certificate for returned container, fines, container movement report). Types and sizes of transport containers. Classification of transport containers. Unification of containers. Transport marking. Basic, additional and informative inscriptions. Manipulative signs. Transport equipment. Technical requirements for transport containers.

Topic 7. Fundamentals of material science. Metal materials. Classification of materials, their properties, fields of application in pharmacy. Classification, composition, properties, information on the technology of their production. Quality requirements. Definition of the concept of "metals", their characteristic properties, classification. Basic requirements for metal materials used for the manufacture of medical devices. Classification of metals and alloys. Physical and mechanical indicators of ferrous and non-ferrous metals. Ferrous metals and their alloys (list and definition). Alloy steels (definition). Quality indicators of

metals and alloys. Classification of steels according to the degree of alloying. Corrosion-resistant stainless steels. Non-ferrous metals and their alloys (main list and definition). Physical and chemical properties of copper and its alloys. The main copper alloys and their grades used for the manufacture of medical instruments. Precious metals (list, properties and use in medicine). The concept of the technological process of manufacturing medical products. Materials for making medical instruments. Concept of corrosion of metals and protection against it.

Topic 8. Rubber, production methods. The manufacture of rubber items.

The concept of rubber. Classification of rubber. Production of rubber. The concept of the technological process of manufacturing rubber products. Rubber aging. Storage and restoration of rubber products. Rubber quality requirements, labeling, packaging, storage, sterilization and disinfection.

Topic 9. Glass, ceramic materials and products from them.

Definition of the term "glass". Composition and properties of glass. Classification of glass for medical devices by purpose. Ceramic materials (definition, composition and properties). Wood, cardboard, paper, leather and its substitutes. Requirements for the quality of materials, labeling, packaging, storage, sterilization and disinfection.

Topic 10. Polymer materials and plastic masses used in pharmacy

General characteristics of natural and synthetic polymers and plastics based on them (definition, composition). Classification of plastic masses by purpose and composition. Information about the technology of their production. Composition of plastic masses and requirements for their functional properties. Application of polymers in pharmacy and medicine. Quality requirements for plastic products. Marking, packaging, storage conditions and sterilization of plastic products.

Topic 11. Commodity analysis of general medical surgical instruments.

Medical classification tools Classification of general surgical instruments. Cutting tools (knives and scalpels, medical chisels, surgical hammers, reamers, scissors and medical saws, bone nippers). Clamping tools (hemostatic clamps, clamps for temporary crossing of blood vessels, gastric and intestinal clamps, needle holders, root forceps, tweezers, forceps). The main elements of the design. Material used to make medical instruments. Corrosion resistance test. Classification. Assortment. Technical requirements. Functional tests. Packaging, labeling, transportation, storage. Methods of determining quality. Sterilization. Rules of acceptance and accounting. Impression tools (hooks, wound dilators, Buyalsky spatula, spatulas, etc.). Probing and probing tools. The main elements of the design. Classification. Assortment. Technical requirements. Functional tests. Packaging, labeling, transportation, storage. Methods of determining quality. Sterilization. Rules of acceptance and accounting.

Topic 12. Commodity analysis of special tools: neurosurgical, ophthalmological and otorhinolaryngological.

Classification of special tools by purpose. Neurosurgical instruments. Tools for opening bone tissues (rotary wheel with a set of drills and cutters, wire saw, nippers, bone forceps). Cutting tools (scissors, hemostatic clamps, wound expanders, spatulas, cannulas, bone spoons). Ophthalmological tools (scalpels and knives, scissors, ophthalmic spoons, loops, spatulas, tweezers, impression tools, probes, Filatov-Martynovskiy set). Otorhinolaryngological instruments. Diagnostic devices, cutting instruments, tracheotomy instruments, ear instruments, auxiliary instruments. Purpose of each group of special tools. Main elements and design features. Materials used for making special tools. Classification by purpose. Assortment. Technical requirements. Packaging, labeling, transportation and storage. Methods of determining quality. Sterilization.

Topic 13. Commodity analysis of special tools: urological, obstetric and gynecological.

Classification of special tools by purpose. Urological instruments. Catheters, bougies, probes, devices for grinding stones in the urinary bladder and their removal. Obstetrical and gynecological instruments. Obstetric instruments, embryotomy instruments, gynecological instruments, vacuum devices, a set of instruments for termination of pregnancy. Purpose of each group of special tools. Main elements and design features. Materials used for making special tools. Assortment. Technical requirements. Packaging, labeling, transportation and storage. Methods of determining quality. Sterilization.

Topic 14. Commodity analysis of equipment for dentistry. Dental equipment: dental chairs, drills, dental devices, flexible sleeves, tips. Products for therapeutic dentistry: dental burs, tools for root canal processing, tools for filling teeth and removing dental deposits. Sealing material. Tools for surgical stomatology: dental forceps, dental elevators. Auxiliary tools. Products for orthopedic stomatology and dental prosthetics: artificial teeth, abrasive tools, devices for dental prosthetics.

Topic 15. Commodity analysis of technical means for traumatology.

Product types, assortment of tools and equipment used when working with plaster. Tools for skeletal extraction. Tools used in osteosynthesis. Assortment of medical tires. Classification by purpose of equipment used in traumatology and technical requirements for it. Commodity analysis of tools and equipment for traumatology upon their acceptance. Storage of technical means for traumatology.

Topic 16. Commodity analysis of suture materials and surgical needles.

Suture materials and their purpose. Classification of suture materials. Suture materials that dissolve: catgut, okcelon, vicryl, etc. Suture materials that do not dissolve, linen thread, mylar thread, horse hair, metal wire, Michel staples. Suture materials that are conditionally resorbable. Product types. Technical requirements for suture materials. Sterilization of suture materials. Packaging, labeling, transportation and storage of suture materials in accordance with standards. Surgical needles. Classification of needles by purpose: surgical, skin, general purpose (thick and thin), eye, circumscribing, intestinal (bent, straight, with a flat-oval part), vascular (bent and straight), renal. Product types. Classification of needles depending on their design: by shape, degree of bending, section and point, shape of the eye, size. Needles are atraumatic. Ligature needles and forks. Conventional designations of needles. Technical requirements for needles. Packaging, labeling, transportation and storage. Methods of sterilization of surgical needles, forks and ligature needles. Methods of determining quality. Suturing surgical devices.

Topic 17. Commodity analysis of tools and devices for punctures, injections, transfusions and suction

Assortment of disposable and reusable syringes. Classification of syringes by design and purpose. Injection and puncture-biopsy needles. Infusion and transfusion devices. Technical requirements. Packaging, labeling, transportation and storage. Methods of determining quality. Sterilization. Trocars. Equipment for transfusions, injection and suction

Topic 18. Commodity analysis of equipment for disinfection and sterilization.

The concept of disinfection, sterilization and pre-sterilization treatment. Disinfection and sterilization methods used in pharmacy and medicine. Physical methods of disinfection and sterilization (thermal sterilization, sterilization by infrared, ultrahigh-frequency, ultraviolet radiation, radiation and plasma sterilization) of medical and pharmaceutical products. Chemical methods of disinfection and sterilization of medical products. Agents used for chemical disinfection and sterilization. Equipment for sterilization (steam sterilizer, air sterilizer, gas sterilizer, sterilization boxes, etc.). Classification of steam sterilizers: by design, heating method, control. Steam sterilizers are stationary, portable, bilateral, etc. Installations for radiation sterilization of medical instruments, suture material and pharmaceuticals with an electron accelerator and gamma rays. Plasma sterilizers. Disinfection equipment (portable boilers, stationary boilers, disinfection chambers, disinfection-shower installations, hydraulic sprayers, "Dezinfal" sprayer, manual sprayers, etc.).

Topic 19. Commodity analysis of rubber products and patient care items.

Designation of rubber products and patient care items. Hollow rubber products obtained by molding (rubber warmers, rubber ice bladders, rubber washers, rubber washers, syringes, rubber irrigator cups, rubber rings, rubber balloons and bellows). Tubular elastic products: gas removal tubes, catheters and probes. Elastic products for anesthesia and artificial respiration: airways, intubation tubes, anesthesia mask, oral nose. Latex products: surgical and anatomical gloves, mittens, caps for medical pipettes, nipples, children's Subjects of patient care. Packaging, labeling, storage, transportation. Disinfection and sterilization.

Topic 20. Commodity analysis of wound dressings and bandages.

Dressing materials and their purpose. Kind dressing material: hygroscopic medical wool (ophthalmic, hygienic, surgical), compress, gauze, lignin. The main types of raw materials for obtaining dressing material and requirements for it. Ready-made dressings: medical non-woven non-sterile and sterile bandages. Modern dressing materials in the treatment of infectious and inflammatory diseases of the

skin and soft tissues. Types of plasters. Carrying out product analysis (identification of product type, quality assessment). Laboratory determination of the functional properties of the dressing material (absorbing properties, capillarity, wettability). Packaging, labeling, transportation and storage.

Topic 21. Ophthalmic optics. Commodity analysis of devices and means for research, correction and protection of the organs of vision.

Devices and tables for the study of visual acuity. Devices for determining the refraction of the eye. Devices and apparatus for the study of visual functions. Devices for examination and research of the eye. Eye lenses: purpose, classification (according to the nature of the optical action, according to the number of optical zones for ametropia correction, according to the purpose). Lenses for correction of eye refraction anomalies (myopia, hypermetropia, astigmatism). Lenses for presbyopia and convergence anomalies (strabismus). Technical requirements for eyeglass lenses, marking, packaging, transportation, storage. Methods of determining the type, sign and optical power of a lens. Spectacle frames: purpose, classification (by the shape of the rims, by the materials, by the type of earrings), technical requirements. Safety glasses: purpose, classification, technical requirements for glass and frames. Devices for checking vision correction devices (dioptric meter, centriscope). Technical requirements for ophthalmic devices, packaging, transportation. Prescriptions for glasses. Selection of glasses. Latin words that are used when writing a prescription for glasses. Contact lenses: classification, labeling, packaging, storage.

Content module 2. Commodity analysis of related products pharmacy assortment products and devices for diagnosing the state of the body. Pharmacy warehouse. Reception and storage of medicines and medical products.

Topic 22. Commodity analysis of related products pharmacy assortment products.

Mineral waters. Classification. Requirements for mineral waters. Packaging, labeling, transportation and storage of mineral waters. Rules for accepting mineral waters. Determination of organoleptic indicators. Cosmetic products. Classification of cosmetics. General requirements for cosmetic products. Packaging, labeling and storage of cosmetics. Special food products, classification and characteristics. Classification, storage, labeling of essential oils. Disinfectants. Assortment. Release form. Packaging, labeling, transportation and storage of disinfectants. Repellents Classification, labeling, storage. pharmaceutical care when dispensing repellents. Storage of medical leeches and care for them. Means for care of the oral cavity. Toothbrushes, toothpastes, mouthwashes and irrigators. Pharmaceutical care for the release of oral care products.

Topic 23. Oxygen, nitrous oxide used in medicine. Commodity analysis of oxygen, breathing and anesthetic equipment.

Medical oxygen. Requirements for the quality of medical oxygen. Passport for medical oxygen. Oxygen cylinders and oxygen pillows (assortment, marking, technical requirements, storage). Receiving oxygen cylinders and returning them to the supplier. Gearbox. Dispensing oxygen to the consumer from the pharmacy. Disinfection of oxygen pillows and mouthpieces after their use. Safety rules when working with oxygen. Accounting for released oxygen. Nitrous oxide. Receiving cylinders with nitrous oxide from the supplier. Release of nitrous oxide compounds. The procedure for using nitrous oxide in cylinders in medical institutions. Storage and transportation of nitrous oxide cylinders. Oxygen-respiratory and anesthesia equipment: oxygen concentrators, oxygen inhalers and inhalation anesthesia devices. Merchandising operations when accepting oxygen-breathing and anesthetic equipment.

Topic 24. Commodity analysis of devices for inspection, endoscopy and introscopy.

Commercial types, range of devices for inspection, endoscopy and introscopy. Classification of devices for inspection, endoscopy and introscopy by purpose. Methods of disinfection and sterilization of parts of devices for examination, endoscopy and introscopy that come into contact with patients. Merchandising analysis of devices for inspection, endoscopy and introscopy upon their acceptance. Care of devices and their storage.

Topic 25. Acceptance of goods to the pharmacy warehouse. Acceptance and release of goods, quality assessment, organization of storage and transportation. The process of movement of goods in the pharmacy network and commercial transactions related to it. The procedure for drawing up contracts with suppliers of medical and pharmaceutical goods. Acceptance of goods to the pharmacy warehouse in terms of quantity and quality. Release of goods from pharmacy warehouses.

Topic 26. Organization of storage of medicines and medical products.

The main factors affecting the quality of pharmaceutical products. Requirements for pharmaceuticals and their storage. Quality control, stability and shelf life of drugs. Requirements for storage of different groups of drugs depending on their physical and chemical properties. Assortment of medical products. The main factors affecting the quality of medical products. Requirements for medical devices and their storage conditions. Quality control, expiration dates.

Topic 27. Protecting the pharmaceutical market from counterfeit and low-quality medicines and medical devices.

Relevance and causes of falsification of medicinal products. Classification signs of falsification of medicinal products. Detection of falsified medicinal products during incoming quality control. Means of protection of packages and labels of medicinal products against counterfeiting.

Topic 28. Commodity analysis of devices for diagnosis and treatment.

Product types, assortment of devices and devices for diagnostics. Classification of diagnostic devices by purpose. Methods of disinfection and sterilization of parts of diagnostic equipment that come into contact with patients. Merchandising analysis of diagnostic devices upon their acceptance. Care of devices and their storage. Classification and structure of devices for measuring blood pressure of a person. Carrying out a product analysis of devices for measuring blood pressure in pharmacies. Pharmaceutical care during the implementation of devices for measuring blood pressure. Classification of means for controlling human body temperature. The structure of the medical maximum thermometer. Tests and test systems as pharmacy assortment products. The principle of operation, classification and characteristics of pregnancy tests. Glucose meters. Test strips for self-monitoring of blood glucose

Topic 29. Commodity analysis of laboratory and pharmacy glass, products made from it. Pharmacy equipment. Technical means for laboratories and pharmacies.

Laboratory glassware. Thin-walled dishes: glasses, watering cans, glass laboratory refrigerators, measuring dishes. Thick-walled dishes. Pharmacy glassware. Means of mechanization used in pharmacies. Grinding equipment. Dosing devices. Heater for melting ointment bases. Infusion devices. Product types. Technical requirements. Rules of reception, storage, transportation. Furniture for laboratories and pharmacies, their technical characteristics. Tables, cabinets, carts. Product types. Requirements for them. Commodity analysis of tools and devices for laboratory research. Devices for weighing and determining density. Equipment for heating and thermostating. Apparatus for distillation. Equipment for centrifugation and filtration.

4. The structure of the Discipline

Names of topics	Total	Number of hours				
		Including				
		lect ures	Semin ars	practical classes	lab classes	ISW
<i>Content module 1. Basics of commodity science. Commodity analysis of medical products and finished medicines. Packaging, labeling.</i>						
Topic 1. Fundamentals foundations of commodity science. Normative documentation in the pharmaceutical industry.	6	2	-	4	-	-
Topic 2. Classification and coding of goods.	4	2	-	2	-	-
Topic 3. Fundamentals of commodity analysis of pharmacy products.	4	-	-	2	-	2
Topic 4. Packaging and labeling of medical products.	2	-	-	2	-	-

Topic 5. Packaging, labeling of finished medicines. Closers.	8	2	-	4	-	2
Topic 6. Commodity analysis of transport containers.	2	-	-	-	-	2
Topic 7. Fundamentals of material science. Metal materials.	8	2		2		4
Topic 8. Rubber, production methods. The manufacture of rubber items.	4	-	-	-	-	4
Topic 9. Glass, ceramic materials and products from them.	4					4
Topic 10. Polymer materials and plastic masses used in pharmacy	4	-	-	-	-	4
Topic 11. Commodity analysis of general surgical medical instruments.	6	2	-	4	-	-
Topic 12. Commodity analysis of special instruments: neurosurgical, ophthalmological, otorhinolaryngological.	4	-	-	4	-	-
Topic 13. Commodity analysis special instruments: urological, obstetric and gynecological.	2	-	-	2	-	-
Topic 14. Commodity analysis of equipment for dentistry.	2	-	-	2	-	-
Topic 15. Commodity analysis of technical means for traumatology.	4	-	-	-	-	4
Topic 16. Commodity analysis of suture materials and surgical needles.	4	2		2	-	-
Topic 17. Commodity analysis of tools and devices for punctures, injections, transfusions and suction	4	2	-	2	-	-
Topic 18. Commodity analysis of equipment for disinfection and sterilization.	6	2	-	-	-	4
Topic 19. Commodity analysis of rubber products and patient care items.	6	2	-	4	-	-
Topic. 20. Commodity analysis of wound dressings and bandages	4	2	-	2	-	-
Current test control. Control of practical skills #1	2	-	-	2	-	-
<i>Together according to content module 1</i>	90	20		40		30
<i>Content module 2. Commodity analysis of related products pharmacy assortment products and devices for diagnosing the state of the body. Pharmacy warehouse. Reception and storage of medicines and medical products.</i>						
Topic 21. Ophthalmic optics. Commodity analysis devices and	6	2	-	4	-	-

means for research, correction and protection of the organs of vision.						
Topic 22. Commodity analysis of related products pharmacy assortment products	10	2	-	8	-	-
Topic 23. Commodity analysis of oxygen, breathing and anesthetic equipment.	6	-	-	2	-	4
Topic 24. Commodity analysis of devices for inspection, endoscopy and introscopy.	4	-	-		-	4
Topic 25. Acceptance of goods to the pharmacy warehouse.	4	2	-	2	-	-
Topic 26. Organization of storage of medicines and medical products.	4	-	-	4	-	-
Topic 27. Protecting the pharmaceutical market from counterfeit and low-quality medicines and medical devices.	6	2	-	-	-	4
Topic 28. Commodity analysis medical devices for diagnosis and treatment.	8	2	-	6	-	-
Topic 29. Commodity analysis laboratory and pharmacy glass, products made from it. Pharmacy equipment. Technical means for laboratories and pharmacies.	8	-	-	-	-	8
<i>Current test control Control of practical skills #2</i>	2	-	-	2	-	-
Graded test	2	-	-	2	-	-
<i>Together according to content module 2</i>	60	10		30		20
Total	150	30		70		50

5. Topics of lectures / seminars / Practical Classes / laboratory classes

5.1. Topics of lectures

No	Topic name	hours
1	Topic 1. Lecture 1. Basics of commodity science. Normative documentation in the pharmaceutical industry.	2
2	Topic 2. Lecture 2. Classification and coding of goods.	2
3	Topic 5. Lecture 3. Packaging, labeling of finished medicines. Closers.	2
4	Topic 7. Lecture 4. Fundamentals of materials science. Metal materials.	2
5	Topic 11. Lecture 5.	2

	Commodity analysis of general surgical medical tools.	
6	Topic 16. Lecture 6. Commodity analysis of suture materials and surgical needles.	2
7	Topic 17. Lecture 7. Commodity analysis of tools and devices for punctures, injections, transfusions and suction	2
8	Topic 18. Lecture 8. Commodity analysis of equipment for disinfection and sterilization.	2
9	Topic 19. Lecture 9. Commodity analysis of rubber products and patient care items.	2
10	Topic 20. Lecture 10. Commodity analysis of wound dressings and bandages.	2
11	Topic 21. Lecture 11. Ophthalmic optics. Commodity analysis devices and means for research, correction and protection of the organs of vision.	2
12	Topic 22. Lecture 12. Commodity analysis of related products pharmacy assortment products	2
13	Topic 25. Lecture 13. Acceptance of goods to the pharmacy warehouse.	2
14	Topic 27. Lecture 14. Prevention of circulation of falsified medicinal products in Ukraine.	2
15	Topic 28. Lecture 15. Commodity analysis medical devices for diagnosis and treatment.	2
	Total	30

5.2. Topics of seminar classes

Seminar classes are not provided.

5.3. Topics of practical classes

No	Topic name	hours
1.	Topic 1. Practical class 1 . Regulatory documentation. Standardization.	2
2.	Topic 1. Practical class 2. Conformity assessment of medical devices. Registration of medicines.	2
3.	Topic 2. Practical class 3. Classification and coding of goods.	2
4.	Topic 3. Practical class 4. Fundamentals of commodity analysis of pharmacy assortment goods.	2
5.	Topic 4. Practical class 5. Packaging and labeling of medical devices.	2
6.	Topic 5. Practical class 6 Packaging, labeling of finished medicines.	2
7.	Topic 5. Practical class 7. Closers. Packaging materials in pharmacy.	2
8.	Topic 7. Practical class 8. Fundamentals of materials science. Metal materials.	2
9.	Topic 11. Practical class 9. Commodity analysis of general surgical tools: cutting and clamping.	2
10.	Topic 11. Practical class 10.	2

	Commodity analysis of general surgical tools: retracting and exposing , medical probes.	
11.	Topic 12. Practical class 11. Commodity analysis of neurosurgical, ophthalmological	2
12.	Topic 12. Practical class 12 Product analysis of special otorhinolaryngological tools.	2
13.	Topic 13. Practical class 13. Commodity analysis urological, obstetric and gynecological special instruments.	2
14.	Topic 14. Practical class 14. Commodity analysis of equipment for dentistry.	2
15.	Topic 16. Practical class 15. Commodity analysis of suture materials and surgical needles.	2
16.	Topic 17. Practical class 16. Commodity analysis of tools and devices for punctures, injections, transfusions and suction	2
17.	Topic 19. Practical class 17. Commodity analysis of rubber products.	2
18.	Topic 19. Practical class 18. Commodity analysis of patient care items.	2
19.	Topic 20. Practical class 19. Commodity analysis of wound dressings and bandages.	2
20.	Practical class 20. <i>Current test control. Control of practical skills #1</i>	2
21.	Topic 21. Practical class 21. Ophthalmic optics. Refraction anomalies of the eye.	2
22.	Topic 21. Practical class n 22. Commodity analysis devices and means for research, correction and protection of the organs of vision.	2
23.	Topic 22. Practical class 23. Commodity analysis of related products pharmacy assortment products	2
24.	Topic 22. Practical class 24. Commodity analysis of related products pharmacy assortment products	2
25.	Topic 22. Practical class 25. Commodity analysis of related products pharmacy assortment products	2
26.	Topic 22. Practical class 26. Commodity analysis of related products pharmacy assortment products	2
27.	Topic 23. Practical class 27. Commodity analysis of oxygen, breathing and anesthetic equipment.	2
28.	Topic 25 Practical class 28. Acceptance of goods to the pharmacy warehouse.	2
29.	Topic 26. Practical class 29. Organization of storage of medicines and medical products.	2
30.	Topic 26. Practical class 30. Cold chain. Requirements for the storage of vaccines and toxoids.	2
31.	Topic 28. Practical class 31. Commodity analysis of medical devices for diagnosis and treatment. (tonometers, thermometers, glucometers)	2
32.	Topic 28. Practical class 32. Commodity analysis medical devices for diagnosis and treatment. (inhalers, nebulizers)	2
33.	Topic 28. Practical class 33. Commodity analysis of means for individual oral care.	2

34.	Practical class 34. <i>Current test control. Control of practical skills #2</i>	2
35.	Practical class 35. <i>Graded test</i>	2
	Total	70

5.4. Topics of laboratory classes

Laboratory classes are not provided.

6. Independent Student Work

No	Title of the topic / types of assignments	hours
1.	Topic 3. Preparation for practical class 3.	2
2.	Topic 5. Preparation for practical classes 5.	2
3.	Topic 6. Work with methodological developments.	2
4.	Topic 7. Preparation for practical class 6	4
5.	Topic 8. Work with methodological developments.	4
6.	Topic 9. Work with methodological developments.	4
7.	Topic 10. Work with methodological developments.	4
8.	Topic 15. Work with methodological developments.	4
9.	Topic 18. Work with methodological developments.	4
10.	Topic 23. Preparation for practical class 23	4
11.	Topic 24. Work with methodological developments.	4
12.	Topic 27. Work with methodological developments	4
13.	Topic 29. Work with methodological developments.	8
	Total	50

7. Teaching methods

Lectures: lectures, lectures-visualizations, narration, explanation, conversation, instruction, discussion, debate, discussion of problem situations, situational learning, illustration (including multimedia presentations), demonstration, presentation of the results of own research.

Practical classes: Discussion, role-playing games, solving situational problems, case studies, solving calculation problems, practicing practical skills, and completing individual assignments.

Independent work: independent work with the recommended basic and additional literature, with electronic information resources.

8. Forms of control and methods of assessment (including criteria for assessing learning outcomes)

Current control: oral survey, control written works, evaluation of individual assignments, defense of the results of practical works, evaluation of reports, evaluation of activity in the class, testing (pen-and-paper or computerized), evaluation of required skills

Final control: graded test in the form of an oral survey

Evaluation of the current educational activity in a practical class:

- Evaluation of theoretical knowledge on the topic of the class:
 - methods: survey, solving a situational clinical problem;
 - the highest grade available is 5, the lowest passing grade is 3, the failing (unsatisfying) grade is 2.
- Evaluation of practical skills on the subject of the lesson:
 - methods: standardized and include control of vocabulary, grammar, and communication skills;
 - the highest grade available is 5, the lowest passing grade is 3, and the failing (unsatisfying) grade is 2.

The grade for one practical class is the arithmetic mean of all components and can only be a whole number (5, 4, 3, 2), which is rounded according to the statistical method.

Current Evaluation Criteria at Practical Classes

Rating	Evaluation criteria
Excellent "5"	The higher education student is fluent in the material required, demonstrates versatile and deep knowledge of the program material, can perform the tasks provided for in the program successfully; has mastered the content of the required and additional literature, and has realized the interrelationship of individual sections of the discipline and their importance for the future profession; has demonstrated creative abilities in understanding and using educational program material and the ability to update and replenish knowledge independently; level of competence - high (creative);
Good "4"	The HE student has demonstrated complete knowledge of the educational program material, successfully performs the tasks provided by the program, has mastered the basic literature recommended by the program, and is capable of independent updating and renewal in the course of further education and professional activities, but makes minor mistakes, which are eliminated by the student him/herself when the examiner points them out; the level of competence is sufficient (constructive and variable);
Satisfactory "3"	The HE student does not have sufficient knowledge but knows the fundamental curriculum material to the extent necessary for further education and subsequent work in the profession; copes with the tasks provided by the program, makes some mistakes in the answers at the exam and when completing the exam tasks, but has the necessary knowledge to overcome the mistakes made under the guidance of a scientific and pedagogical worker; level of competence - average (reproductive);
Unsatisfactory "2"	The HE student does not acquire knowledge of program material, makes fundamental mistakes in the assignments provided by the program, cannot use the knowledge in further studies on their own, did not manage to master the skills of independent work; the level of competence is low (receptive-productive)

Only those applicants who have fulfilled the requirements of the discipline's curriculum, have no academic debt and whose average grade for the current academic activity in the discipline is at least 3.00 are allowed to take the final control in the form of a graded test.

Evaluation of the results of the students' training during the final control - graded test.

The content of the evaluated activities	Score
Answers to theoretical questions	2
Performance of a practical task with evaluation of the obtained results	2
Solving the situational task	1

Graded test paper *template*:

Graded test paper No. ____

1. Classification of medical instruments. General requirements, labeling, packaging, storage. General surgical instruments: classification, characteristics.
2. Mineral waters. Classification. Rules for taking mineral waters. Packaging, labeling, transportation and storage of mineral waters.
3. Practical task #1. Analyze the proposed prescription for glasses or soft contact lenses. (Prescription is issued during differentiated credit)
4. Practical task #2. Conduct a trade analysis of the proposed medical device in accordance with regulatory documentation. (The tool is issued during the differential assessment)
5. Situational task. A 70-year-old female visitor came to the pharmacy to buy a wrist tonometer, recommended by a friend. The pharmacist completed the purchase, saying that it is really a very convenient device option. Assess the situation. Justify the answer. Specify the features of using wrist tonometers.

Criteria for Assessment of Learning Outcomes at the Graded Test

Rating	Evaluation criteria
Excellent	The student correctly, accurately, and fully completed all tasks of the final control, clearly and logically answered the questions posed by the examiners, knows professional and scientific English terminology, and has versatile and deep knowledge of the program material.
Good	The student completed all the tasks of the final control quite fully and clearly and answered logically the questions asked by the examiner. However, the student makes minor mistakes, which are eliminated on his/her own when the examiner points them out.
Satisfactory	The student partially fulfilled all the control tasks, but the answers to additional questions are unclear. The student has basic theoretical knowledge but uses professional and scientific terminology inaccurately. There are significant mistakes in the answers, but the student is able to overcome the mistakes under the guidance of the examiner.
Unsatisfactory	The student did not complete the control tasks and did not answer most additional questions. He has not mastered the basic theoretical knowledge and demonstrates a low proficiency in professional and scientific terminology. There are a significant number of gross errors in the answers.

9. Distribution of points received by students of higher education

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

Table for converting a traditional grade into a multi-point scale

Traditional four-point scale	200-Point Grading 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 of each applicant in learning the educational component. The conversion of the traditional assessment (average score for the academic discipline) into a 200-point one is performed by the information and technical department of the University. According to the received points on a 200-point scale, the achievements of the students 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 given 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	Top 10% students
B	The next 25% students
C	The next 30% students
D	The next 25% students
E	The next 10% students

10. Methodological support

- Working program on the discipline
- Syllabus
- Guidelines for practical classes
- Guidelines for independent student work
- Multimedia presentations
- Situational/case tasks
- Scenarios of role-playing games (if necessary)

Educational and methodical literature:

1. L. M. Unhurian, O. I Bieliaieva, O. A. Stepanova, I.V. Vyshnytska . A text book of pharmaceutical and medical commodity science for students of the international faculty of full-time and distance learning: ONMedU, 2022.- 107 p.

11. Questions for Preparing for the Final Assessment

1. The concept of a product and its consumer value. The concept of the classification of goods and its categories. Purpose, purpose and general rules of classification. Types of product classification.
2. Definition of the concept of "standardization". Principles, levels, subjects and objects of standardization. The main goals and tasks of standardization. Definition of the term "standard". Types of standards. Designation of regulatory documentation (ND).
3. Product coding systems. Coding system in the commodity nomenclature of foreign economic activity (TN ZED). Bar coding. Calculation of the control number.
4. Definition of the terms "analysis", "commodity analysis", "expertise", "commodity expertise". Functions, goals and tasks of commodity analysis.
5. Requirements for medical and pharmaceutical products. The main properties (physical, chemical, technological, etc.) that ensure the quality of goods. The concept of merchandising operations, their classification and characteristics.
6. Classification of materials, their properties, fields of application in pharmacy. Composition, properties, information about their manufacturing technology. Requirements for the quality of

- materials. Marking, packaging, storage conditions. Sterilization.
7. Definition of the concept of "metals", their characteristic properties, classification. Basic requirements for metal materials used for the manufacture of medical devices.
 8. Materials for the manufacture of medical instruments. The concept of metal corrosion and protection against it.
 9. Classification of medical instruments. Corrosion resistance test. Classification of general surgical instruments. The main elements of the design of medical instruments. The material used for their manufacture.
 10. Cutting tools. Clamping tools. Imprint tools. Probing and drilling tools. Classification. Assortment. Technical requirements. Functional tests.
 11. Packaging, marking, transportation, storage of medical instruments. Methods of determining quality. Sterilization. Rules of acceptance and accounting.
 12. Classification of special tools by purpose. Purpose, main design elements, assortment, technical requirements
 13. Dental equipment. Products for therapeutic stomatology. Sealing material. Tools for surgical stomatology. Products for orthopedic stomatology and dental prosthetics.
 14. Classification of non-metallic materials, their properties, application in cosmetology, pharmacy and medicine. The concept of rubber. Classification of rubber. Production of rubber. The concept of the technological process of manufacturing rubber products. Rubber aging. Storage of rubber products. Rubber quality requirements, labeling, packaging, storage, sterilization and disinfection.
 15. Definition of the term "glass". Composition and properties of glass. Classification of glass for medical devices by purpose. Requirements for the quality of materials, labeling, packaging, storage, sterilization and disinfection.
 16. Ceramic materials (definition, composition and properties). Requirements for the quality of materials, labeling, packaging, storage, sterilization and disinfection.
 17. Wood, cardboard, paper, leather and its substitutes. Requirements for the quality of materials, labeling, packaging, storage, sterilization and disinfection. Requirements for the quality of materials, labeling, packaging, storage, sterilization and disinfection.
 18. General characteristics of natural and synthetic polymers and plastics based on them (definition, composition). Classification of plastic masses by purpose and composition. Information about the technology of their production.
 19. Rubber products and items for patient care. Purpose, packaging, labeling, storage, transportation. Disinfection and sterilization.
 20. Suture materials and their purpose. Classification of suture materials. Technical requirements. Sterilization of suture materials.
 21. Surgical needles. Classification. Product types. Needles are atraumatic. Ligature needles and forks. Conventional designations of needles. Technical requirements. Packaging, marking, transportation and storage. Methods of sterilization. Methods of determining quality. Suturing surgical devices.
 22. Syringes for injections. Classification of syringes.
 23. Injection and puncture-biopsy needles. Technical requirements. Packaging, marking, transportation and storage. Methods of determining quality. Sterilization. Cases for sterile storage of syringes and injection needles.
 24. Equipment for transfusions, injection and suction. Product types and purpose of medical equipment. Assortment and technical requirements. Methods of disinfection of parts of medical equipment in contact with the patient. Care of devices and their storage.
 25. Instruments and equipment for traumatology. Classification by purpose of equipment used in traumatology and technical requirements for it. Commodity analysis. Storage.
 26. Concepts of disinfection, sterilization and pre-sterilization treatment. Disinfection and sterilization methods used in pharmacy and medicine. Equipment for sterilization.
 27. Disinfectants. Assortment. Release form. Packaging, labeling, transportation and storage of disinfectants.
 28. Dressing materials and their purpose. Ready dressings. Packaging, labeling, transportation and

storage of dressings. Sterilization.

29. Mineral waters. Cosmetic products. Chemical reagents and their classification. Classification. Requirements for mineral waters. Packaging, labeling, transportation and storage of mineral waters. Special food products. Medicinal cosmetics.

30. Devices and tables for visual acuity research. Devices for determining the refraction of the eye, for the study of visual functions, for examination and research of the eye.

31.. Spectacle lenses: purpose, classification. Technical requirements for eyeglass lenses, marking, packaging, transportation, storage. Methods of determining the type, sign and optical power of a lens

32. Prescriptions for glasses. Selection of glasses. Latin words that are used when writing out a prescription for glasses.

33 Medical oxygen. Nitrous oxide. Requirements for the quality of medical oxygen. Passport for medical oxygen. Oxygen cylinders and oxygen pillows (assortment, marking, technical requirements, storage). Receiving oxygen cylinders and returning them to the supplier.

34. Classification of pharmaceuticals depending on storage conditions, pharmacological action, physicochemical properties, methods of application, expiration date, method of obtaining, aggregate state, types and methods of packaging and organoleptic quality indicators, requirements for the quality of dosage forms.

35. Packaging and its functional purpose. Classification of pharmaceutical packaging, properties of packaging, labeling and transportation of pharmaceuticals.

36. Concepts of "container", "container for pharmaceutical use" and "packaging". Classification of containers. Marking. Container storage.

37. Classification of sealing means by definition, design features, fixing methods, materials, production methods. Requirements for sealing means. Storage.

38. Receipt and release of goods, quality assessment, organization of storage and transportation. The process of the movement of goods in the pharmacy network and the merchandising operations related to it. The procedure for drawing up contracts with suppliers of medical and pharmaceutical goods. Acceptance of goods to the pharmacy warehouse in terms of quantity and quality. Release of goods from pharmacy warehouses.

39. The main factors affecting the quality of pharmaceutical products. Requirements for pharmaceuticals and their storage. Quality control, stability and shelf life of drugs.

40. Product types, assortment of devices and devices for diagnostics. Classification of diagnostic devices by purpose.

41 Classification, product types, range of devices for inspection, endoscopy and introscopy.

42. Dental equipment. Products for therapeutic dentistry. Instruments for surgical dentistry. Products for orthopedic dentistry and dental prosthetics.

43. Classification of steam sterilizers: by design, heating method, control. Installations for radiation sterilization of medical instruments, suture material and pharmaceuticals with an electron accelerator and gamma rays.

44. Oral care products. Toothbrushes, toothpastes, rinses and irrigators. Pharmaceutical care for the dispensing of oral care products.

45. Cosmetic products. Classification of cosmetic products. General requirements for cosmetic products. cosmetic products. Packaging, labeling and storage of cosmetics.

46. General characteristics of natural and synthetic polymers and plastics based on them (definition, composition). Classification of plastics by purpose and composition. Information about the technology of their manufacture.

47. Commodity types, assortment of tools and equipment used in working with gypsum. Tools for skeletal traction. Tools used in osteosynthesis.

48. Commodity analysis of instruments for examination, endoscopy and introscopy.

49. Equipment for sterilization (steam sterilizer, air sterilizer, gas sterilizer, sterilization boxes, etc.)

50. Protection of the pharmaceutical market from counterfeit, substandard medicines and medical devices.

12. Recommended literature

Required:

1. Medical and pharmaceutical commodity science: a textbook for university students. education institutions / I.I. Baranova, S.M. Kovalenko, D.V. Semenov and others. - Kharkiv: NFaU: Golden Pages, 2017. - 320 p.
2. Medical and pharmaceutical commodity science: a textbook for university students. education institutions / I.I. Baranova, S.M. Kovalenko, Yu.O. Bospala, T.V. Dudyun, S.O. Mamedova. - Kh.: National Academy of Sciences: Original, 2016. - 304 p.
3. Merchandising at a pharmaceutical enterprise; study guide for students of higher education of the second (master's) level of the specialty "Pharmacy" / I.I. Baranova, S.M. Kovalenko, S.V. Breusova et al.-Kharkiv: NSFaU, 2018.-160 p.
4. Gromovyk B. P. Workshop on medical and pharmaceutical commodity science. Part 2. Pharmaceutical commodity science: a study guide for teachers / B.P. Gromovyk, N.B. Yarko, I.Ya. Horodetska - Lviv: Prostir M, 2018. -139 p.
5. Medical and pharmaceutical commodity science: education. manual / O.B. Kalushka, T.A. Groshovyi, A.V. Znaevska, M.B. Demchuk. - Ternopil: TDMU, 2017. - 484 p.
6. L. M. Unhurian, O. I Bieliaieva, O. A. Stepanova, I.V. Vyshnytska . A text book of pharmaceutical and medical commodity science for students of the international faculty of full-time and distance learning: ONMedU, 2022.- 107 p.
7. Good pharmacy practice in community and hospital pharmacy settings <http://apps.who.int/medicinedocs/documents/s21088en/s21088en.pdf>
8. International health systems http://www.pnhp.org/facts/international_health_systems.php?page=all
9. Standarts for quality of pharmacy services <http://fip.org/files/fip/Statements/latest/Dossier%20004%20total.PDF>
10. Fundamentals of biological physics and medical equipment: textbook (high school I-III r. A.) / L.F. Emchik. - seconded., Rev. for students of higher medical institutions of I-III levels of accreditation All-Ukrainian specialized publishing house "Medicine" 2014.- 392 p. Ukrainian language.

13. Electronic information resources

1. European Pharmacopoeia. <https://www.edqm.eu/en/european-pharmacopoeia-ph-eur-10th-edition>
2. U.S. Food and Drug Administration. <https://www.fda.gov/>
3. World Health Organization (WHO) i <https://www.who.int/>
4. European Medicines Agency (EMA) <https://www.ema.europa.eu/en>
5. European Directorate for the Quality of Medicines and HealthCare (EDQM), <https://www.edqm.eu/>
6. Harmonized System (HS) Codes <https://www.trade.gov/harmonized-system-hs-codes>
https://eltident.com/wp-content/uploads/2016/12/41_suturmanual-5.pdf
7. DSTU ISO 780-2001. Package, image labeling for operating with goods.
8. ISO 37:1994, Rubber; vulcanized or thermoplastic — Determination of tensile stress-strain properties.
9. ISO 188:1982, Rubber; vulcanized - Accelerated ageing or heat-resistance tests.
10. ISO 2859-1:1989, Sampling procedures for inspection by attributes — Part 7: Sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection. ISO 4648:1991, Rubber, vulcanized or thermoplastic -Determination of dimensions of test pieces and products for test purposes.
11. ISO 7000:1989, Graphical symbols for use on equipment — Index and synopsis.

12. ISO 13485:2003 Medical devices – Quality management systems [Electronic resource]: 15. 15. Requirements for regulatory purposes. – Retrieved from: http://www.iso.org/iso/catalogue_detail?csnumber=36786. (Reference date of 10.12.2017).
13. Legislation of Ukraine [Electronic resource]. - Access mode <http://zakon.rada.gov.ua/laws>
14. Normative-directive documents of the Ministry of Health of Ukraine [Electronic resource]. - Access mode: / [http:// mozdocs.kiev.ua](http://mozdocs.kiev.ua)
15. State Service of Ukraine for Medicines and Drug Control <https://www.dls.gov.ua/>
16. Medicines of Ukraine. All about medicines and their quality <https://lick.ukr/>
17. Compendium online. [Electronic resource]. - Access mode: <https://compendium.com.ua/bad/>.
18. Weekly "Pharmacy" [Electronic resource]. - Access mode: <https://www.apteka.ua/>
19. Search base for drugs [Electronic resource]. - Access mode: <https://tabletki.ua/uk/>.
20. Search base for drugs [Electronic resource]. - Access mode: <http://likicontrol.com.ua/>.
21. Medscape search database [Electronic resource]. – Access mode: Medscape <https://www.medscape.com/pharmacists>.