MINISTRY OF HEALTH OF UKRAINE

NATIONAL UNIVERSITY OF PHARMACY

APPROVED
Deputy Chairman of the Admissions Committee

_____Inna VLADYMYROVA

«25» April 2025

PROGRAM
of professional test for admission to study according to the educational program «PHARMACY»

(for foreign citizens and stateless persons, who have a basic based on NRQ5 Pharmacy in the specialty 226 "Pharmacy/Pharmacy Industrial Pharmacy" (EPP Pharmacy))

Specialty I8. Pharmacy
(specialization I8.01. Pharmacy)

Areas of knowledge I Health care and social security

Level of higher education - second (master's)

Educational degree - master's degree

Kharkiv, 2025

EXPLANATORY NOTE

The program is designed for foreign citizens and stateless persons who enter on the basis of NRQ5 Pharmacy in specialty 226 "Pharmacy/Pharmacy industrial pharmacy" (EPP Pharmacy) specialty I8. Pharmacy, specialization I8.01.Pharmacy.

The professional entrance test determines the level of basic theoretical knowledge of applicants in the following educational components: pharmaceutical chemistry, pharmacognosy, pharmaceutical technology, pharmacology, organization and economics in pharmacy.

Testing is designed for two astronomical hours

CONTENT

PHARMACEUTICAL CHEMISTRY

1. Fundamentals of pharmaceutical analysis.
2. Pharmaceutical analysis. The nature and character of impurities. General and individual methods for detecting impurities. The value of physical constants as indicators of the relative purity of drugs. Chromatographic methods of detecting impurities. Development of requirements for research on the purity of medicinal substances.
3. Titrimetric and instrumental methods of analysis. The influence of the multifunctional nature of drugs on the choice of quantitative method.
4. Features of the analysis of inorganic drugs. Analysis of drugs that contain elements of group VII of the periodical system of D.I. Mendeleev.
5. Analysis of drugs that contain elements of group VI of the periodical system of D.I. Mendeleev.
6. Analysis of drugs that contain elements of V, IV, III groups of the periodical system of D.I. Mendeleev.
7. Analysis of drugs that contain elements of group II of the periodical system of D.I. Mendeleev.
8. Analysis of drugs that contain elements of groups I, VIII of the periodical system of D.I. Mendeleev.
9. Analysis of drugs, derivatives of carboxylic acids of the aliphatic series and their salts.
10. General provisions and articles of the State Pharmacopoeia on the study of the quality of organic drugs. Determination of physical constants of organic substances to confirm identification and relative purity. The value of physical and physico-chemical methods of analysis in the study of the quality of drugs of organic nature.
11. Analysis of drugs from the group of paraffins and halogenated saturated hydrocarbons of the aliphatic series.
12. Analysis of drugs, derivatives of alcohols, aldehydes and esters of the aliphatic series.
13. Analysis of drugs, derivatives of carboxylic and amino acids of the aliphatic series and their salts.
14. Analysis of drugs, amidated derivatives of carbonic acid.
15. Analysis of drugs, terpenoid derivatives.

16. Analysis of drugs, derivatives of phenols and aromatic amines.
17. Analysis of drugs, derivatives of aromatic acids.
18. Analysis of drugs derived from aromatic amino acids.
19. Analysis of drugs derived from sulfonic acids of the aromatic series.
20. Analysis of drugs derived from five-membered heterocycles.
21. Analysis of drugs derived from six-membered heterocycles.
22. Analysis of drugs derived from pyrimidine.
23. Analysis of drugs derived from condensed heterocycles.
24. Drugs from the group of alkaloids: general characteristics, classification. General methods of identification and quantification.
25. Analysis of drugs and drugs from the group of carbohydrates and glycosides.
26. Medicines from the group of vitamins: general characteristics, classification. Analysis of drugs and drugs from the group of vitamins of aliphatic, alicyclic, aromatic and heterocyclic structure.
27. Analysis of drugs from the group of antibiotics of alicyclic, aromatic and heterocyclic structure and their semi-synthetic analogues.

PHARMACOGNOSY

1. The subject of pharmacognosy. Tasks of pharmacognosy at the present stage of development. Basic concepts, terms, purpose and tasks of pharmacognosy. A brief historical overview of the development of pharmacognosy as a science.
2. Methods of pharmacognostic analysis of LRS. The value of pharmacognosy in the practice of pharmacists.
3. Basics of procurement and standardization of medicinal plant raw materials. Raw material base of medicinal plants. Organization of procurement of certain groups of medicinal plant raw materials.
4. Chemical analysis of LRS, which contains compounds with glycosidic bonds. Determination of the swelling index of raw materials. Medicinal plants and raw materials that contain polysaccharides.
5. Medicinal plants, raw materials and products that contain lipids and lipoids.
6. Medicinal plants and raw materials that contain vitamins and glycosides.
7. General characteristics of phenolic compounds. MP and MPR containing simple phenols and their derivatives. General characteristics of coumarins, chromones. MP and MPR, which contains coumarins and chromones.
8. Medicinal plants and raw materials that contain flavonoids.
9. Medicinal plants and raw materials that contain quinones.
10. Medicinal plants and raw materials that contain tannins, lignans, xanthones.
11. Analysis of essential oils. Medicinal plants and raw materials that contain essential oils.
12. Medicinal plants and raw materials that contain monoterpenoids.
13. Medicinal plants and raw materials containing sesquiterpenoids.
14. Medicinal plants and raw materials that contain iridoids.

15. Medicinal plants and raw materials that contain aromatic compounds.
16. Medicinal plants and raw materials containing triterpenoids and saponins.
17. Medicinal plants and raw materials that contain cardioglycosides (cardiac glycosides).
18. Medicinal plant raw materials that contain different groups of biologically active substances.
19. Medicinal plants and raw materials that contain various biologically active substances.
20. Medicinal plants and raw materials used in homeopathy.
21. Analysis of dosage forms with medicinal plant raw materials. Analysis of fees and teas from MPR. Analysis of plant powders.

PHARMACEUTICAL TECHNOLOGY

1. General issues of drug technology. State regulation of drug production.
2. Dosage in pharmacy practice.
3. Preparation of simple and complex powders with medicinal substances that differ in the prescribed amount, bulk density and particle structure.
4. Preparation of complex powders with toxic and potent substances. Triturations.
5. Preparation of complex powders with colored, fragrant and finely ground substances.
6. Preparation of complex powders with extracts and semi-finished products.
7. Features of preparation of liquid dosage forms in the pharmacy.
8. Preparation of concentrated solutions.
9. Preparation of liquid dosage forms by bulk method by dissolving dry drugs and using concentrated solutions.
10. Special cases of preparation of aqueous solutions. Drops.
11. Preparation of liquid dosage forms by diluting standard pharmacopoeial liquids. Non-aqueous solutions.
12. Solutions of the Navy. Colloidal solutions.
13. Suspensions.
14. Emulsions.
15. Infusions and decoctions of medicinal plant raw materials.
16. Infusions and decoctions of extracts-concentrates. Get down.
17. Liniments and ointments are homogeneous.
18. Ointments suspension and emulsion.
19. Combined ointments.
20. Preparation of suppositories by pumping method.
21. Preparation of suppositories by pouring.
22. Features of preparation of aseptic dosage forms.
23. Solutions for injection.
24. Solutions for injection that require stabilization.
25. Isotonic and infusion solutions. Solutions for injection with thermolabile substances. Suspension for injection.
26. Ocular dosage forms. Dosage forms with antibiotics.
27. Difficult recipes. Pharmaceutical incompatibilities.

PHARMACOLOGY

1. Medicinal prescription. Rules for prescribing recipes. Functions of the components of the recipe. Methods of analysis of the structure and content of the prescription.
2. The content of pharmacology, its tasks and place among other pharmaceutical disciplines. The main stages of development of pharmacology. Principles of classification of medicines.
3. Dosage of drugs. Classification and determination of doses. Latitude of therapeutic action and therapeutic index (TI).
4. Pharmacodynamics. Factors influencing the pharmacodynamics of drugs. General concepts of pharmacokinetics.
5. Drugs that affect the peripheral nervous system.
6. Means that act mainly on the afferent nerves. Pharmacological characteristics of depressants: local anesthetics, enveloping, adsorbent, astringent. Pharmacological characteristics of stimulants: irritants, bitters, preparations containing venom of bees and snakes.
7. Drugs that affect the efferent nervous system: cholinotropic (cholinomimetics, anticholinesterase, m-cholinoblockers, ganglioblockers, muscle relaxants) and adrenotropic drugs (adrenomimetics, adrenoblockers and sympatholytics).
8. CNS depressants: anesthetics, ethyl alcohol, hypnotics, anticonvulsants, antiparkinsonian drugs, neuroleptics, tranquilizers, sedatives.
9. Pharmacological correction of pain: natural and synthetic narcotic analgesics, non-narcotic analgesics.
10. CNS stimulants: antidepressants, psychostimulants, analeptics, nootropic drugs and adaptogens.
11. Hormonal and antihormonal drugs: hormones of the anterior and posterior pituitary gland, thyroid hormones and antithyroid drugs, parathyroid hormone, adrenal cortex hormones, female and male sex hormones, prostaglandins.
12. Vitamin preparations: classification and pharmacological characteristics.
13. Means that affect metabolism.
14. Drugs that affect hematopoiesis, blood clotting and fibrinolysis.
15. Drugs that affect the function of the cardiovascular system: cardiac glycosides, antiarrhythmic, antianginal, antiatherosclerotic, angioprotectors and antioxidants, antihypertensive.
16. Drugs that affect kidney function. Diuretics.
17. Means acting on biometrics.
18. Agents acting on the function of the respiratory system. Respiratory stimulants. Antitussives of central (narcotic and non-narcotic) and peripheral action. Expectorants. Drugs that improve bronchial patency.
19. Drugs that affect the digestive system. Drugs that improve or reduce appetite. Vomiting, antiemetic, antiemetic drugs. H_2-histamine receptor blockers. Antacids. Gastroprotectors. Means that regulate the motor function of the gastrointestinal tract.

Drugs that affect the function of the pancreas. Cholagogues and hepatoprotective agents. Laxatives and carminatives. Laxatives.
20. Drugs that affect immunity: immunosuppressants, immunostimulants, antihistamines, antiserotonin, antibradykinin drugs.
21. Antiblastomas.
22. Antidotes. Classification, mechanism of action of drugs and indications for use. Radioprotectors.
23. Antiseptics and disinfectants.
24. Synthetic chemotherapeutic agents.
25. Antibiotics. TB drugs, antisyphilitic drugs.
26. Means for the treatment of protozoal infections.
27. Antifungal drugs.
28. Anthelmintics.
29. Antiviral drugs.

ORGANIZATION AND ECONOMY OF PHARMACY

1. Basic principles of organization of medical care to the population.
2. Organization of pharmacies as health care facilities in accordance with the requirements of Good Pharmacy Practice (GPP).
3. Organization of prescription and over-the-counter dispensing of drugs.
4. Determining the cost of individual drugs.
5. Accounting for outpatient prescriptions.
6. Organization of manufacturing and quality control of drugs in pharmacies.
7. Organization of over-the-counter release of drugs from pharmacies.
8. Organization of the pharmacy with inventories.
9. Features of providing inpatients in modern conditions.
10. Organization of providing pharmacy establishments with goods of pharmacy assortment.
11. Fundamentals of economics and accounting of pharmacies.
12. Accounting for the receipt of inventory in the pharmacy.
13. Costs of inventory. Retail and wholesale trade. Other types of costs.
14. Accounting for other costs of goods.
15. Accounting for the movement of other assets (tangible assets).
16. Accounting for cash flows and settlement transactions.
17. The system of remuneration of pharmacy workers. Indicators of labor and wages, their definition.
18. Reporting of pharmacies.
19. Inventory of inventory in pharmacies.
20. The turnover of the pharmacy. Trade overlays.
21. Planning the receipt of goods. Fixed and current assets of pharmaceutical companies.
22. The costs of the pharmacy.
23. Profit and profitability of the pharmacy.

24. Taxation of pharmacies.
25. Basics of pricing for medicines and medical devices.
26. Theoretical foundations of pharmaceutical information.

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EVALUATION CRITERIA

The answer is evaluated on a scale, based on the maximum possible amount – 200 points for 30 test tasks.

Each exam ticket contains 25 closed tests and 5 open tests.

The answer to the closed type test is evaluated:

4-3 points (maximum score) – the task is completed completely and correctly;

2-1 points – the answer is incomplete or contains correct and incorrect answers;

0 points – the task was not started or the task was performed incorrectly.

Open-ended tests (situational problems, computational problems or structural-logical schemes) are evaluated:

20 points – the maximum score for a fully and correctly completed task, clearly and competently written equation of reactions, the necessary calculations are given, the correct answer is obtained with an explanation of the sequence of their actions;

19-17 points – if the task is performed correctly, but insignificant inaccuracies are assumed, the irrational way of the decision of the set task is chosen;

16-14 points – if at least half of the task is completed, while no significant mistakes are made in writing chemical formulas and equations, calculation formulas;

13-11 points – if at least half of the task is completed, while significant errors are made in writing chemical and calculation formulas, reaction equations, nomenclature, units of measurement of initial and obtained results;

10-8 point – if less than half of the task is completed, with significant errors, ignorance of the nomenclature and calculation formulas, errors in calculations;

7-1 point – if the task was not completed, but it was started;

0 points – if the task is not started.

The maximum number of points that an entrant can receive as a result of a written test is 200 points.

Applicants who received 150 points or more according to the results of written testing are allowed to participate in the competition.

The program is considered and approved at the meeting of the Admissions Committee
Protocol № 8 of April, 25, 2025.

Chair of the Subject Commission, professor **Hanna PANFILOVA**

Executive secretary of Admissions Committee, associate professor **Oleg KRYSKIV**