



**MINISTRY OF HEALTH OF UKRAINE  
NATIONAL UNIVERSITY OF PHARMACY  
Faculty of Pharmacy  
Department of Pharmacognosy and Nutriciology**

**PHARMACOGNOSTIC BASIS OF PHYTOTHERAPY**

**WORK PROGRAM  
of educational component**

**training for** \_\_\_\_\_ **the second (master's) level** \_\_\_\_\_  
(Higher Educational Level Name)

**specialty** \_\_\_\_\_ **«226 Pharmacy, Industrial Pharmacy»** \_\_\_\_\_  
(Code and Specialty Name)

**knowledge industry** \_\_\_\_\_ **«22 Healthcare»** \_\_\_\_\_  
(Code and Knowledge Field Name)

**of educational program** \_\_\_\_\_ **«Pharmacy»** \_\_\_\_\_  
(Educational Program Name)

The work program of the educational component «Pharmacognostic basis of phytotherapy» in specialty 226 «Pharmacy, Industrial pharmacy» educational program «Pharmacy» (4.10д)англ and (4.10д)\*англ for applicants for higher education 4 year of study.

EDUCATIONAL COURSE TEAM:

KYSLYCHENKO Viktoriia, head of the Department of Pharmacognosy and Nutriciology, doctor of pharmaceutical sciences, professor; KRIVORUCHKO Olena, professor of the higher education institution of the Department of Pharmacognosy and Nutriciology of the National University of Pharmacy, Doctor of Pharmacy. Sciences, professor; TARTYNSKA Ganna, associate professor of the institution of higher education of the Department of Pharmacognosy and Nutriciology of the National University of Pharmacy, candidate of pharmacology. Science, associate professor.

Work program were reviewed at the Department of Pharmacognosy and Nutritiology meeting  
Record from « 1 » of September 2023 № 1

Head of the Department



Prof. Viktoriia KYSLYCHENKO

Work program has been approved at the meeting of the Methodical Commission of chemical disciplines session  
Record from « 5 » of September 2023 № 1

Head of the Specialized Committee



Prof. Viktoriya GEORGIYANTS

## 1. Description of the educational component

**Language of study:** *English*

**Status of the educational component:** *selective*

**Prerequisites for studying the educational component:** As an educational component "Pharmacognostic basis of phytotherapy":

- is based on the knowledge gained by students in the study of Latin, botany, organic chemistry, biological chemistry, analytical chemistry, physical and colloidal chemistry, pharmaceutical and toxicological chemistry, human physiology, pharmacology, drug technology, technology of perfumes and cosmetics, clinical pharmacy.

The subject of study of the educational component "Pharmacognostic basis of phytotherapy" is the study of the medicinal properties of plants, natural raw materials and products from it.

**Information content of the educational component.** 3,0 ECTS credit 90 hours are assigned to the study of the educational component.

## 2. Objectives and tasks of the educational component

**The purpose of teaching the educational component** "Pharmacognostic basis of phytotherapy": formation of a holistic view of the possibilities, forms and methods of phytotherapy among applicants for higher education, understanding of its place and role in the complex treatment, rehabilitation and prevention of the patient, taking into account the choleric approach based on the established diagnosis; training in methods of preparation of various dosage forms, as well as the ability to find and determine, by morphological features, official and unofficial medicinal products in nature, periods of their rational preparation, drying and use conditions.

The main **objectives** of the educational component "Pharmacognostic basis of phytotherapy": to define the key concepts of herbal medicine as a clinical discipline; learn the basic principles of herbal medicine, the rules for compiling the formulation of fees and teas; interpret the relationship between biologically active substances of medicinal plants and their pharmacotherapeutic effects; master the technique of manufacturing basic dosage forms from plants (infusions, decoctions, vapors, macerates, tinctures) and the use of herbal remedies; choose herbal remedies of general action depending on the existing functional disorders in patients of different profiles; be able, if necessary, to provide professional advice to the patient and the doctor on phytotherapy and the choice of herbal medicines and special foods; find the necessary information on pharmacognosy, phytochemistry, phytotherapy, resource management of the medicinal plants and use it in professional activities; learn the types of regulatory documentation; modern requirements of the Pharmacopeial Committee when creating the AND; processing of medical raw materials in Ukraine; current state of production of domestic phytochemicals and dietary supplements; use poisonous and potent plants in herbal medicine; learn the general characteristics of toxic biologically active substances; to diagnose toxic impurities in phytocollections; learn the basic principles of treatment with medicinal plant materials; pharmacotherapeutic classification of medicinal plant materials; main chemical, pharmacological and technological incompatibilities of medicinal products; the role of different groups of biologically active substances in prevention and treatment of various pathological conditions of a person; learn information about agricultural and industrial crops as a source of biologically active substances and their use in the treatment of various diseases; develop information leaflets, hold conferences, webinars for doctors and advise the public on issues related to medicinal plants, raw materials and products of natural origin.

## 3. Competencies and planned educational outcomes

The educational component "Pharmacognostic Basis of Phytotherapy" provides applicants with the following competencies:

- **integral:** the ability to solve typical and complex specialized tasks and practical problems in professional pharmaceutical activities in the field of health care on a socially oriented basis or in the learning process, which involves conducting chemical, biopharmaceutical, biomedical, sociological, etc. research and/or innovation and is characterized by uncertain conditions and requirements; integrate knowledge, think critically and solve complex issues, make decisions in difficult unpredictable conditions, formulate judgments in the presence of incomplete or limited information, taking into account aspects of social and moral responsibility; clearly and unambiguously communicate their conclusions and knowledge, reasonably substantiating them, to a professional and non-professional audience.

**general:**

GC 6. Knowledge and understanding of the subject area and understanding of professional activity.

**special (professional):**

PC 16. Ability to organize and conduct the procurement of medicinal plant raw materials in accordance with the rules

of Good Practice of Cultivation and Collection of Raw Materials of Plant Origin (GACP), as a guarantee of the quality of medicinal plant raw materials and medications based on it. Ability to predict and calculate ways to solve the problem of conservation and protection of thickets of wild medicinal plants, in accordance with current legislation.

PC 20. Ability to develop methods for quality control of medications, including active pharmaceutical ingredients, medicinal plant raw materials and excipients using physical, chemical, physicochemical, biological, microbiological, pharmacotechnological and pharmacorganoleptic control methods.

Integrative final **program learning outcomes** (PLO), the formation of which is facilitated by the educational component: PLO 7. To perform professional activities using creative methods and approaches.

PLO 28. To organize and conduct rational procurement of medicinal plant raw materials. To develop and implement measures for the protection, reproduction and rational use of wild species of medicinal plants.

As a result of studying the educational educational component, the applicant must

**know:**

- basic principles of herbal medicine;
- rules for compiling prescriptions for fees for the treatment of various diseases;
- the main chemical, technological and pharmacological incompatibilities found in the recipes of the collection;
- functions of different types of medicinal plant materials in the body;
- methods of pharmacognostic screening of new types of medicinal plants;
- morphological and anatomical features of medicinal plants and raw materials used in evidence-based and traditional medicine;
- the chemical composition of medicinal plant materials, taking into account the content of the main active and related substances;
- the main factors of influence on the interaction of biologically active substances in the composition of medicinal plant materials and the body;
- pharmacotherapeutic classification of medicinal plant materials;
- features of harvesting, drying and primary processing of plant materials using scientific and traditional medicine;
- the current state of the resources of medicinal plants in Ukraine and measures for resource conservation and reproduction of the resources of the MP;
- current state of production of domestic phytochemicals and dietary supplements;
- Fundamentals of dietology and diet therapy, the use of agricultural and industrial crops as a source of new types of plant materials used in the prevention and treatment of various diseases;
- basic information about the distribution and place of growth of the MP, used in scientific and traditional medicine
- regulatory and legal basis for the use of wild-growing MP resources at the present stage;
- organizing the harvesting of medicinal products;
- general rules for the harvesting of MPM and measures for the protection of natural commercial thickets of the MP;
- basics of industrial cultivation of MP;
- a system of standardization and certification of medicinal products, phytochemicals in Ukraine; documenting the results of the analysis of MPM; the legal meaning of the certificate;
- the main methods and forms of application of MPC in pharmaceutical practice and industrial production;
- the main directions of application in medicine of medicinal products of plant and animal origin;
- safety rules when working with medicinal plants and medicinal raw materials.

**be able to:**

- determine the systematic affiliation of medicinal plants;
- to determine, by morphological features, medicinal plant materials studied in this course in native and herbarized form;
- to carry out harvesting, drying, primary processing and storage of MPM, which are studied in this course, taking into account its chemical composition;
- characterize different classes of chemical compounds, both the main and accompanying active substances in the composition of medicinal plant materials;
- to explain the influence of factors of the organism itself and the external environment on the formation of the pharmacological effect;
- explain the mechanisms of the physiological effects of the main active substances of medicinal plant materials on the body;
- group types of medicinal plant materials according to their physiological effects on the body;
- create recipes and prepare herbal preparations with the inclusion of official and unofficial medicinal products for the prevention and treatment of diseases of various systems and organs of the body;

- identify official and unofficial raw materials, analyze multicomponent collections, briquettes, granules, capsules, whole and cut raw materials, determine their authenticity and good quality;
- to develop methods for pharmacognostic analysis of MPM and substances derived from it;
- to carry out phytochemical screening of MPM;
- to use the knowledge and skills gained in the study of special disciplines in further professional activities.

**possess:**

an applicant for a higher education degree (master) must have general (GC 06) and professional (special) (PC 16, PC 20) competencies (expected learning outcomes).

**4. The educational component structure**

Names of content modules and topics	The amount of hours			
	the whole amount	full time study (4,10д)		
		l.	pract. lessons	self-study
<b>Module 1. Rules and principles of phytotherapy. MP and MPM, herbs and teas used in herbal medicine for diseases of various systems of the human body.</b>				
<b>Content module 1. Basis of phytotherapy</b>				
<b>Topic 1.</b> Definition of the course "Pharmacognostic basis of phytotherapy" and its relationship with related disciplines. The current state of the production of phytopreparations and dietary supplements.	4,5	0,5	1	3
<b>Topic 2.</b> Processing of MPM in Ukraine.	4,5	0,5	1	3
<b>Topic 3.</b> Poisonous and potent plants in herbal medicine. General characteristics of poisonous biologically active substances. Diagnosis of toxic impurities.	5,5	0,5	2	3
<b>Topic 4.</b> Basic principles of treatment of plant materials. Pharmacotherapeutic classification of medicinal plant materials. Chemical, pharmacological and technological incompatibilities in the preparation of prescriptions for fees.	5,5	0,5	2	3
<b>Control of the substantial module 1</b>	7	-	2	5
<b>The whole amount of hours for the content module 1</b>	<b>27</b>	<b>2</b>	<b>8</b>	<b>17</b>
<b>Content module 2. "MP and MPM, fees and tea used in phytotherapy for diseases of different human body systems."</b>				
<b>Topic 5.</b> Phytotherapy of allergic diseases and diseases of the immune system.	5,5	0,5	1	4
<b>Topic 6.</b> Phytotherapy of neuroses.	5,5	0,5	1	4
<b>Topic 7.</b> Phytotherapy for respiratory diseases.	6,5	0,5	2	4
<b>Topic 8.</b> Phytotherapy for diseases of the cardiovascular system.	7	1	2	4
<b>Topic 9.</b> Phytotherapy of gastrointestinal diseases.	5,5	0,5	1	4
<b>Topic 10.</b> Phytotherapy for diseases of the kidneys and genitourinary system.	7	1	2	4
<b>Topic 11.</b> Phytotherapy in dermatology and cosmetology. Aromatherapy.	4,5	0,5	1	3
<b>Topic 12.</b> Phytotherapy in the prevention and treatment of radiation sickness.	4,5	0,5	1	3
<b>Topic 13.</b> Phytotherapy for hypo- and avitaminosis.	4,5	0,5	1	3
<b>Topic 14.</b> Agricultural and industrial crops as a source of BAS and use in the treatment of various diseases.	4,5	0,5	1	3
<b>Control of the substantial module 2</b>	7	-	2	5
<b>The whole amount of hours for the content module 2</b>	<b>62</b>	<b>6</b>	<b>15</b>	<b>41</b>
<b>Semester credit from the module 1</b>	<b>1</b>	<b>-</b>	<b>1</b>	<b>-</b>
<b>Total for Module 1</b>	<b>90</b>	<b>8</b>	<b>24</b>	<b>58</b>

**5. Content of of the educational component**

**Module 1. Rules and principles of phytotherapy. MP and MPM, herbs and teas used in herbal medicine for diseases of various systems of the human body.**

**Content module 1. Basis of phytotherapy**

**Topic 1.** Definition of the course "Pharmacognostic basis of phytotherapy" and its relationship with related disciplines. The current state of the production of phytopreparations.

**Topic 2.** Processing of MPM in Ukraine.

**Topic 3.** Poisonous and potent plants in herbal medicine.

**Topic 4.** Basic principles of plant treatment.

**Content module 2. MP and MPM, herbs and teas used in herbal medicine for diseases of various systems of the human body.**

**Topic 5.** Phytotherapy of allergic diseases and diseases of the immune system.

**Topic 6.** Phytotherapy of neuroses.

**Topic 7.** Phytotherapy for respiratory diseases.

**Topic 8.** Phytotherapy for diseases of the cardiovascular system.

**Topic 9.** Phytotherapy of gastrointestinal diseases.

**Topic 10.** Phytotherapy for diseases of the kidneys and genitourinary system.

**Topic 11.** Phytotherapy in dermatology and cosmetology. Aromatherapy.

**Topic 12.** Phytotherapy in the prevention and treatment of radiation sickness.

**Topic 13.** Phytotherapy for hypo- and avitaminosis.

**Topic 14.** Agricultural and industrial crops as a source of BAR and use in the treatment of various diseases.

**Semester credit from the module 1**

**6. Topics of lectures**

№	Name of topic	The amount of hours
1.	<b>Topic 1.</b> Definition of the course "Pharmacognostic basis of phytotherapy" and its relationship with related disciplines. The current state of the production of phytopreparations and dietary supplements.	0,5
2.	<b>Topic 2.</b> Processing of MPM in Ukraine.	0,5
3.	<b>Topic 3.</b> Poisonous and potent plants in herbal medicine. General characteristics of poisonous biologically active substances. Diagnosis of toxic impurities.	0,5
4.	<b>Topic 4.</b> Basic principles of treatment of plant materials. Pharmacotherapeutic classification of medicinal plant materials. Chemical, pharmacological and technological incompatibilities in the preparation of prescriptions for fees.	0,5
5.	<b>Topic 5.</b> Phytotherapy of allergic diseases and diseases of the immune system.	0,5
6.	<b>Topic 6.</b> Phytotherapy of neuroses.	0,5
7.	<b>Topic 7.</b> Phytotherapy for respiratory diseases.	0,5
8.	<b>Topic 8.</b> Phytotherapy for diseases of the cardiovascular system.	1
9.	<b>Topic 9.</b> Phytotherapy of gastrointestinal diseases.	0,5
10.	<b>Topic 10.</b> Phytotherapy for diseases of the kidneys and genitourinary system.	1
11.	<b>Topic 11.</b> Phytotherapy in dermatology and cosmetology. Aromatherapy.	0,5
12.	<b>Topic 12.</b> Phytotherapy in the prevention and treatment of radiation sickness.	0,5
13.	<b>Topic 13.</b> Phytotherapy for hypo- and avitaminosis.	0,5
14.	<b>Topic 14.</b> Agricultural and industrial crops as a source of BAS and use in the treatment of various diseases.	0,5
	<b>The whole amount of hours</b>	<b>8,0</b>

## 7. Topics of seminars

Not provided for in the working curriculum.

## 8. Topics of Practical lessons

№	Name of topic	The amount of hours
1.	<b>Topic 1.</b> Definition of the course "Pharmacognostic basis of phytotherapy" and its relationship with related disciplines. The current state of the production of phytopreparations and dietary supplements.	1
2.	<b>Topic 2.</b> Processing of MPM in Ukraine.	1
3.	<b>Topic 3.</b> Poisonous and potent plants in herbal medicine. General characteristics of poisonous biologically active substances. Diagnosis of toxic impurities.	2
4.	<b>Topic 4.</b> Basic principles of treatment of plant materials. Pharmacotherapeutic classification of medicinal plant materials. Chemical, pharmacological and technological incompatibilities in the preparation of prescriptions for fees.	2
5.	<b>Control of the content module 1</b>	2
6.	<b>Topic 5.</b> Phytotherapy of allergic diseases and diseases of the immune system.	1
7.	<b>Topic 6.</b> Phytotherapy of neuroses.	1
8.	<b>Topic 7.</b> Phytotherapy for respiratory diseases.	2
9.	<b>Topic 8.</b> Phytotherapy for diseases of the cardiovascular system.	2
10.	<b>Topic 9.</b> Phytotherapy of gastrointestinal diseases.	1
11.	<b>Topic 10.</b> Phytotherapy for diseases of the kidneys and genitourinary system.	2
12.	<b>Topic 11.</b> Phytotherapy in dermatology and cosmetology. Aromatherapy.	1
13.	<b>Topic 12.</b> Phytotherapy in the prevention and treatment of radiation sickness.	1
14.	<b>Topic 13.</b> Phytotherapy for hypo- and avitaminosis.	1
15.	<b>Topic 14.</b> Agricultural and industrial crops as a source of BAS and use in the treatment of various diseases.	1
16.	<b>Control of the content module 2</b>	2
17.	<b>Semester credit from module 1</b>	1
	<b>The whole amount of hours</b>	<b>24,0</b>

## 9. Topics of laboratorial lessons

Not provided for in the working curriculum.

## 10. Self-study work

№	Name of topic	The amount of hours
1	<b>Topic 1.</b> Definition of the course "Pharmacognostic basis of phytotherapy" and its relationship with related disciplines. The current state of the production of phytopreparations and dietary supplements.	3
2	<b>Topic 2.</b> Processing of MPM in Ukraine.	3
3	<b>Topic 3.</b> Poisonous and potent plants in herbal medicine. General characteristics of poisonous biologically active substances. Diagnosis of toxic impurities.	3
4	<b>Topic 4.</b> Basic principles of treatment of plant materials. Pharmacotherapeutic classification of medicinal plant materials. Chemical, pharmacological and technological incompatibilities in the preparation of prescriptions for fees.	3
5	<b>Control of the content module 1</b>	5
6	<b>Topic 5.</b> Phytotherapy of allergic diseases and diseases of the immune system.	4
7	<b>Topic 6.</b> Phytotherapy of neuroses.	4

7	<b>Topic 7.</b> Phytotherapy for respiratory diseases.	4
8	<b>Topic 8.</b> Phytotherapy for diseases of the cardiovascular system.	4
9	<b>Topic 9.</b> Phytotherapy of gastrointestinal diseases.	4
10	<b>Topic 10.</b> Phytotherapy for diseases of the kidneys and genitourinary system.	4
11	<b>Topic 11.</b> Phytotherapy in dermatology and cosmetology. Aromatherapy.	3
12	<b>Topic 12.</b> Phytotherapy in the prevention and treatment of radiation sickness.	3
13	<b>Topic 13.</b> Phytotherapy for hypo- and avitaminosis.	3
14	<b>Topic 14.</b> Agricultural and industrial crops as a source of BAS and use in the treatment of various diseases.	3
15	<b>Control of the content module 2</b>	5
<b>The whole amount of hours</b>		<b>58,0</b>

### Tasks for Self-study work

**Topic 1.** Types of AND. Modern requirements of the Pharmacopoeial Committee in the development of AND.

**Topic 2.** Processing of pesticides in Ukraine.

**Topic 3.** General characteristics of poisonous biologically active substances. Diagnosis of toxic impurities.

**Topic 4.** Basic principles of treatment of plant materials. Pharmacotherapeutic classification of medicinal plant materials. Chemical, pharmacological and technological incompatibilities in the preparation of prescriptions for the collection.

**Topic 5.** Phytotherapy of allergic diseases. MP and MPM that are part of the meeting. Unofficial types of MPM.

**Topic 6.** Phytotherapy of neuroses. MP and MPM that are part of the meeting. Unofficial types of MPM.

**Topic 7.** Phytotherapy for respiratory diseases. MP and MPM that are part of the meeting. Unofficial types of MPM.

**Topic 8.** Phytotherapy for diseases of the cardiovascular system. MP and MPM that are part of the meeting. Unofficial types of MPM.

**Topic 9.** Phytotherapy of gastrointestinal diseases. MP and MPM that are part of the meeting. Unofficial types of MPM.

**Topic 10.** Phytotherapy for diseases of the kidneys and genitourinary system. MP and MPM that are part of the meeting. Unofficial types of MPM.

**Topic 11.** Phytotherapy in dermatology and cosmetology. Aromatherapy. MP and MPM that are part of the meeting. Unofficial types of MPM.

**Topic 12.** Phytotherapy in the prevention and treatment of radiation sickness. MP and MPM that are part of the meeting. Unofficial types of MPM.

**Topic 13.** Phytotherapy for hypo- and avitaminosis. MP and MPM that are part of the meeting. Unofficial types of MPM.

**Topic 14.** Agricultural and industrial crops as a source of BAS and their use in the treatment of various diseases.

### 11. Criteria and evaluation order of educational outcomes.

#### Scheme of accrual and distribution of points for full-time higher education applicants

Current testing and independent work								Total
Module 1								
Content module 1			Content module 2					CM2 T8-11
T 1-2	T 3-4	CM1	T 5-6	T 7-8	T 9	T 10	T 11-14	
3-6	3-6	24-38	2-4	2-4	2-4	2-4	2-4	

Criteria for assessing the knowledge and skills of applicants for higher education in the educational component "Pharmacognostic basis of phytotherapy" are developed in accordance with the "Regulations on the procedure for assessing students' knowledge in the credit-modular organization of the educational process in NUPh". The assessment of the success of a higher education applicant for the educational component is rating, is set on a hundred-point scale and has a definition according to the ECTS system and according to the traditional scale adopted in Ukraine.



Evaluation of current educational activities (carried out at each lesson) - test written control, control of theoretical knowledge, practical skills and abilities. Evaluation (in points) is reflected in the calendar-thematic plans of practical classes.

Evaluation criteria	Points
<p><b>Theoretical preparation:</b></p> <ul style="list-style-type: none"> <li>- showed deep knowledge of the theoretical material on the topic of the lesson, set out in the textbook, lecture texts and additional literature;</li> <li>- did a good job of written homework on processing issues and objects of the independent work;</li> <li>- gave exhaustive answers to the questions of the initial control of knowledge and received "5".</li> </ul> <p><b>Practical training:</b></p> <ul style="list-style-type: none"> <li>- identified the MP in herbarized form by morphological features, gave a complete description of it;</li> <li>- demonstrated a good command of the technique of macroscopic analysis of quality control methods;</li> <li>- recognized impurities of morphologically similar plant species;</li> <li>- identified MPM based on microscopic analysis;</li> <li>- carried out a qualitative/quantitative analysis of the main group of biologically active substances contained in the MPM;</li> <li>- carried out the acceptance of the MPM and took the samples necessary for its analysis according to the MPM;</li> <li>- determined the content of loss in mass during drying in the MPM; ash; extractive substances; degree of pest infestation;</li> <li>- determined the morphological, anatomical features of individual components, as well as the numerical indicators of official medicinal collections using macro-, microscopic and phytochemical analysis methods.</li> <li>- handed over to the teacher for checking a well-designed laboratory journal.</li> </ul>	5
<p><b>Theoretical preparation:</b></p> <ul style="list-style-type: none"> <li>- showed a good knowledge of the theoretical material on the topic of the lesson, set out in the textbook and lecture texts;</li> <li>- completed written homework on processing issues and objects of independent work;</li> <li>- gave incomplete answers to the questions of the initial control of knowledge and received "4".</li> </ul> <p><b>Practical training:</b></p> <ul style="list-style-type: none"> <li>- identified MP in herbarized form by morphological features, but gave its incomplete characterization;</li> <li>- demonstrated mastery of the technique of macroscopic analysis of medicinal herbs;</li> <li>- recognized impurities of morphologically similar plant species;</li> <li>- identified MPM based on microscopic analysis;</li> <li>- carried out/carried out, with minor errors, a qualitative/quantitative analysis of the main group of biologically active substances contained in MPM;</li> <li>- carried out the acceptance of medicinal products and took the samples necessary for its analysis according to quality control methods;</li> <li>- determined/determined with small errors in MPM the content of loss in mass on drying; ash; extractive substances; degree of pest infestation;</li> <li>- determined / determined with small errors morphological, anatomical features of individual components, as well as numerical indicators of official drug collections using macro-, microscopic and phytochemical analysis methods.</li> <li>- handed over the completed laboratory journal to the teacher for verification.</li> </ul>	4

<p><b>Theoretical preparation:</b></p> <ul style="list-style-type: none"> <li>- showed knowledge of the theoretical material on the topic of the lesson in the amount that is considered necessary and sufficient to complete the practical part of the lesson;</li> <li>- completed written homework on processing questions and objects of independent work with errors;</li> <li>- gave incomplete answers to the questions of the initial control of knowledge and received "3".</li> </ul> <p><b>Practical training:</b></p> <ul style="list-style-type: none"> <li>- identified MP in herbarized form by morphological features, but gave its incomplete characterization;</li> <li>- demonstrated not very good knowledge of the technique of macroscopic analysis of MPM;</li> <li>- did not recognize impurities of morphologically similar plant species;</li> <li>- identified MPM based on microscopic analysis;</li> <li>- carried out with errors a qualitative/quantitative analysis of the main group of biologically active substances contained in MP;</li> <li>- carried out the acceptance of medicinal products and took the samples necessary for its analysis according to quality control methods;</li> <li>- with errors determined the content of loss in mass during drying in the MPM; ash; extractive substances; degree of pest infestation;</li> <li>- I determined with errors the morphological, anatomical features of individual components, as well as the numerical indicators of official medicinal preparations by the methods of macro-, microscopic and phytochemical analysis.</li> <li>- handed over to the teacher for verification a laboratory journal designed with minor errors.</li> </ul>	3
<p><b>Theoretical training:</b></p> <ul style="list-style-type: none"> <li>- did not show / showed knowledge of theoretical material on the topic of the lesson in a volume that is not considered sufficient to complete the practical part of the lesson;</li> <li>- did not complete / did the written homework on processing issues and objects of independent work with gross errors; - did not give / gave incomplete answers to 1-4 questions of the initial knowledge control.</li> </ul> <p><b>Practical training:</b></p> <ul style="list-style-type: none"> <li>- did not determine / determined with gross errors according to the morphological features of the LR in the herbarized form;</li> <li>- did not demonstrate / demonstrated with gross errors of mastering the technique of macroscopic analysis of MPS;</li> <li>- did not recognize impurities of morphologically similar plant species;</li> <li>- did not identify / identified with gross errors MPM based on microscopic analysis;</li> <li>- did not carry out/carried out with gross errors a qualitative/quantitative analysis of the main group of biologically active substances contained in MP;</li> <li>- did not accept the MPM and did not take the samples necessary for its analysis, according to quality control methods;</li> <li>- did not determine/determined with gross errors in the MPM the content of loss in mass during drying; ash; extractive substances; degree of pest infestation;</li> <li>- did not determine / determined with gross errors morphological, anatomical features of individual components, as well as numerical indicators of official drug collections using macro-, microscopic and phytochemical analysis methods;</li> <li>- handed over to the teacher for verification a laboratory journal, designed with major flaws.</li> </ul>	0-2

If an applicant for higher education came to a practical lesson unprepared, he can be admitted to the practical part of the lesson only after an individual conversation with the teacher on the topic of the lesson.

**Evaluation criteria  
initial controls of practical classes on pharmacognostic basis of phytotherapy**

<b>№ question</b>	<b>Evaluation criteria</b>	<b>Points</b>
	A complete correct definition of the basic rules and principles of herbal medicine is given, the recipe of the collection and teas is correctly drawn up, the analysis of the collection and teas is carried out fully in accordance with the requirements of the AND. The complete correct characterization of toxic, potent substances, the general characteristics of toxic biologically active substances, chemical, pharmacological, technological incompatibilities in the preparation of the formulation of fees are given. The full substantiation of phytotherapy with the use of unofficial types of MPM for various diseases is given.	5
	The full correct definition of the basic rules and principles of herbal medicine is given, the recipe of the collection and teas is correctly drawn up, the analysis of the collections and teas is carried out completely in accordance with the requirements of the AND, but there are no significant errors. A complete correct description of toxic, potent substances, a general description of toxic biologically active substances, chemical, pharmacological, technological incompatibilities when compiling the formulation of fees, but with an incomplete answer, is given. A complete correct phytotherapy with the use of unofficial types of MPRS for various diseases with minor errors is given.	4
	An incomplete definition of the basic rules and principles of herbal medicine is given, the recipe for the collection and teas is correctly drawn up, the analysis of the collection and teas is carried out completely in accordance with the requirements of the AND with errors in writing the recipe. An incomplete description of poisonous, potent substances, a general description of poisonous biologically active substances, chemical, pharmacological, technological incompatibilities in the formulation of fees are given. An incomplete phytotherapy with the use of unofficial types of MPM for various bug diseases is given.	3

**Criteria for evaluating content modules 1-2 from the pharmacognostic basis of phytotherapy**

<b>№ question</b>	<b>Evaluation criteria</b>	<b>Points</b>
1	A complete definition of the concept of herbal medicine and its historical aspects, the basic rules and principles of herbal medicine, the rules for compiling the recipe of a collection and teas are presented. A complete analysis of the collection is given and the correct recommendation for its use is given. A full justification for the expediency and legality of using each component of the above fee is presented.	34-38 CM1
	The full directions of herbal medicine for various diseases are presented with examples of official and unofficial MPM. Complete contraindications for the use of herbal remedies are given.	28-30 CM2
2	Incomplete definitions of the concept of herbal medicine and its historical aspects, the basic rules and principles of herbal medicine, the rules for compiling the recipe of the collection and teas with minor errors are given. An incomplete analysis of the collection is given and a recommendation is given for its use with minor errors. An incomplete substantiation of the expediency and legality of the use of each component of the above fee is given.	28-33 CM1
	Incomplete directions of phytotherapy for various diseases are given with examples of official and unofficial MPM with minor errors. Not complete contraindications for the use of herbal remedies are given.	23-27 CM2
6	An incomplete definition of the concept of herbal medicine and its historical aspects, the basic rules and principles of herbal medicine, the rules for compiling the recipe of the collection and teas with errors are given. An incomplete analysis of the collection is given and a recommendation is given for its use with errors. An incomplete substantiation of the expediency and legality of the use of each component of the above fee is given.	24-27 CM1

Incomplete directions of phytotherapy for various diseases are given with examples of official and non-official MRS with errors. Not complete contraindications for the use of herbal remedies are given.	20-22 CM2
---	--------------

## 12. Forms of progress and semester supervision of academic achievements

*Current control* of theoretical and practical knowledge in the form of an oral, written and test survey using standardized methods for diagnosing knowledge, abilities and skills is carried out at each laboratory session in accordance with the specific goals of the topic and during the individual work of the teacher for topics that are not included in the structure of the lesson and are developed by the student of higher education independently.

*Control of content modules* - control of theoretical knowledge in the form of an oral, written and test survey of applicants for higher education, as well as practical skills in determining the identity and benignity of MPM. Control refers to knowledge and skills, both acquired in classes, and objects and topics developed independently by students of higher education.

*Form of control* - semester credit.

## 13. Methodological support

1. Educational work program of educational component
2. Work program of educational component.
3. Calendar and thematic plans of lectures and laboratory lessons.
4. Textbooks, workshops, manuals, methodical recommendations, etc.
5. Materials of computer presentations of lectures.
6. Methodological recommendations for laboratory lessons, as well as independent work of students of higher education.
7. A list of theoretical questions for independent work of students of higher education.
8. List of questions and tasks for current control of knowledge and skills of higher education applicants.
9. List of theoretical questions and practical tasks for the control of meaningful modules, the exam.
10. Collection of MP herbariums and samples of MPM.

## 14. Reading suggestions

### The main reading suggestions

1. Fundamentals of pharmacognosy and phytotherapy E-BOOK / Heinrich M. et al. – Elsevier Health Sciences, 2017.
2. Bone K., Mills S. Principles and practice of phytotherapy: modern herbal medicine. – Elsevier Health Sciences, 2012.
3. Pharmacognosy: textbook for higher school students / V.S. Kyslychenko, L.V. Upyr, Ya.V. Dyakonova, V.Yu. Kuznetsova, I.G. Zinchenko, O.A. Kyslychenko; ed. by V.S. Kyslychenko. – Kharkiv : NUPh : GoldenPages, 2011. – 552 p.; il.

### Supplementary reading suggestions

1. Governa P. et al. Phytotherapy in the management of diabetes: a review // *Molecules*. – 2018. – T. 23. – №. 1. – P. 105.
2. Kelber O., Bauer R., Kubelka W. Phytotherapy in functional gastrointestinal disorders // *Digestive Diseases*. – 2018. – T. 35. – №. Suppl. 1. – C. 36-42.
3. Lopes C. M. et al. Phytotherapy and nutritional supplements on breast cancer // *BioMed research international*. – 2017. – T. 2017.
4. Textbook of Pharmacognosy and Phytochemistry - E-Book / Shah B., Seth A. – Elsevier Health Sciences, 2012. – 620 p.
5. Pieroni A. et al. Traditional phytotherapy and trans-cultural pharmacy among Turkish migrants living in Cologne, Germany // *Journal of ethnopharmacology*. – 2005. – T. 102. – №. 1. – P. 69-88.
6. Akah P. A., Okoli C. O., Nwafor S. V. Phytotherapy in the management of diabetes mellitus // *Journal of Natural Remedies*. – 2002. – T. 2. – №. 1. – P. 1-10.

7. Laccourreye O. et al. Benefits, pitfalls and risks of phytotherapy in clinical practice in otorhinolaryngology //European annals of otorhinolaryngology, head and neck diseases. – 2017. – Т. 134. – №. 2. – P. 95-99.
8. Kim S. W. Phytotherapy: emerging therapeutic option in urologic disease //Translational andrology and urology. – 2012. – Т. 1. – №. 3. – С. 181.
9. Medicinal plants resource science : handbook for students of higher schools / V.S. Kyslychenko, L.V. Upyr, I.G. Zinchenko, O.A. Kyslychenko, S.I. Stepanova; ed. by V.S. Kyslychenko. – Kharkiv : NUPh : Golden Pages, 2012. – 168 p.
10. Gokhale S. B., Kokate C. K., Purohit A. P. A textbook of Pharmacognosy. 29th Edition. 2017. – 284 p.
11. Kumar N. A Textbook Of Pharmacognosy. A.I.T.B.S. Publishers, India. 2010. – 502 p.
12. Shah B. N., Seth A.K. Textbook of Pharmacognosy and Phytochemistry. Elsevier. 2010. – 587 p.
13. Singh A. A Textbook of Pharmacognosy. Pharma Book Syndicate. 2013. – 836 p.

#### **15. Electronic resources, including the Internet**

1. Website of the Department of Pharmacognosy and Nutriciology – [www.cnc.nuph.edu.ua](http://www.cnc.nuph.edu.ua)
2. Website of the NUPh library – <http://lib.nuph.edu.ua>
3. Electronic archive of the NUPh – <http://dspace.nuph.edu.ua>
4. Center for Distance Technologies of the National Academy of Sciences of Ukraine – [pharmel.kharkiv.edu](http://pharmel.kharkiv.edu)
5. NUPh. Online tests – <http://tests.nuph.edu.ua>
6. Vernadsky National Library of Ukraine – <http://www.nbuv.gov.ua>
7. V.G. Korolenko Kharkiv State Scientific Library – <http://korolenko.kharkov.com>