MINISTRY OF HEALTH OF UKRAINE
ODESA NATIONAL MEDICAL UNIVERSITY

Department of general and clinical pharmacology and pharmacognosy

APPROVED
Vice-rector for scientific and pedagogical activity
_____ Eduard BURIACHKIVSKYI
« 01 » 09 2023 y.

WORKING PROGRAM OF EDUCATIONAL DISCIPLINE «EDUCATIONAL PRACTICE IN PHARMACEUTICAL BOTANY »

(full-time education)

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

2023

The program was compiled on the basis of the educational and professional program "Pharmacy, industrial pharmacy", training of specialists of the second (master's) level of higher education in specialty 226 "Pharmacy, industrial pharmacy" field of knowledge 22 "Health care", approved by the Scientific Council of ONMedU (from 29.06.2023, protocol #8).

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The working program approved at the meeting department pharmacology and pharmacognosy
Protocol No. 1 from 28.08.2023.

Head of the Department,
Doctor of Medicine, Prof. _____ Yaroslav ROZHKOVSKY

Agreed from guarantor of EPP _____ Liana UNGURYAN

Approved at the meeting objective cyclical commission on pharmaceuticals discipline ONMedU
Protocol No. 1 from 29.08. 2023

Head of subject cyclical methodical Commission
from pharmaceuticals discipline ONMedU _____ Natalia FIZOR

Reviewed and approved at the meeting departments _____
Protocol No. ___ of "___" _____ 20__

Head department _____ _____
(signature) *(Name SURNAME)*

Reviewed and approved at the meeting departments _____
Protocol No. ___ of "___" _____ 20__

Head departments _____ _____
(signature) *(Name SURNAME)*

1. Description of the discipline:

Name of indicators	Field of knowledge, specialty, specialization, level of higher education	Characteristics of the discipline
Total number: Credits of ECTS: 3 Hours: 90 Content topics - 9	Field of knowledge 22 «Health care» Specialty 226 « Pharmacy, industrial pharmacy » Level of higher education second (master's degree)	*Full-time (day) education* *Required discipline*
		Course: II
		Semester: IV
		Lectures (0 hours)
		Seminars (30 hours)
		Practical classes (0 hours)
		Laboratories (0 hours)
		Independent work (60 hours)
		including individual tasks (0 hours)
		Form of final control – diff Exam

2. The purpose and objectives of the discipline

Purpose: consolidation, expansion, deepening, use and supplementation of theoretical knowledge and skills in morphology, taxonomy, ecology, coenology and geography of plants through educational and cognitive, emotionally motivated contact with nature.

Task:

- acquaintance with natural and artificial phytocenoses, their medicinal plants, fungi and lichens;
- observation of some ecological adaptations, biological phenomena of plant organisms in dynamics;
- establishment on diagnostic signs independently and by means of determinants of systematic belonging of plants to a family, sort, kind; providing morphological and ecological description of a particular plant;
- distinguish botanically related species from medicinal plants, which are unacceptable impurities to LRS;
- recognition of poisonous, food, essential oil plants, weeds; paying attention to the organs that are plant raw materials;
- acquaintance with the plants cultivated in the open and closed soil, rules of care of them; awareness of the peculiarities of development and the sanitizing role of plants in urban conditions;
- mastering the methods and techniques of herbarium plants, the rules of herbarium design;
- collection of plants for their further herbarium;
- acquaintance with features of preparation of LRS;
- collection, processing and storage of plant material to ensure teaching and research work;
- development of the ability to formulate and substantiate conclusions about the biological state of plants, their life form, age, dependence of the structure and composition of BAS on phenophases, places and conditions of existence;
- awareness of the importance of plants in nature, medicine, pharmacy, economy, etc.
- acquaintance with medicinal plants of the Red Books of Ukraine, formation of a caring attitude to the environment, acquisition of skills in protection, rational use and renewal of medicinal plant resources.

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

- IC - Ability to solve typical and complex specialized problems and practical problems in professional activities in the field of health / pharmacy, or in the learning process, which involves research and / or innovation and is characterized by complexity and uncertainty of conditions and requirements.
- GC 4. Ability to abstract thinking, analysis and synthesis, to learn and be modernly trained.
- GC 6. Knowledge and understanding of the subject area and understanding of professional activity.
- GC 9. Skills in the use of information and communication technologies.
- GC 12. Ability to conduct research at the appropriate level.
- GC 14. Ability to preserve and multiply moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, techniques and technologies. forms of physical activity for active recreation and a healthy lifestyle.
- SC 2. Ability to provide advice on over-the-counter and prescription drugs, medical devices and other products of the pharmacy range; pharmaceutical care during the selection and sale of over-the-counter drugs.
- SC 16. Ability to organize and conduct procurement of medicinal plant raw materials, choose ways to solve the problem of preservation and protection of thickets of wild medicinal plants, in accordance with current legislation.

Program learning outcomes (PLO):

PLO 4. Demonstrate the ability to independently search, analyze and synthesize information from various sources and use these results to solve typical and complex specialized tasks of professional activity.

PLO 7. Perform professional activities using creative methods and approaches.

PLO 12. Analyze information obtained as a result of scientific research, summarize, systematize and use it in professional activities.

PLO 19. Predict and determine the influence of environmental factors on the quality of medicines and consumer characteristics of other products of the pharmacy assortment during their storage.

PLO 28. Organize and carry out rational procurement of medicinal plant raw materials. Develop and implement measures for the protection, reproduction and rational use of wild species of medicinal plants.

As a result of studying the discipline the student must:

Know:

• goals and objectives of educational practice in pharmaceutical botany, its connection with professionally oriented disciplines;

• groups of plants by purpose, systematic position, ecological conditions, life form, structure, presence of certain groups of BAS, therapeutic action, etc., their role and significance in nature and human life, use in pharmacy and medicine;

• elements of ecology, coenology and geography of plants: the nature of the influence of certain environmental factors on the structure of plants and the content of BAS; regularities of the structure of phytocenoses, the nature of their distribution within Ukraine, habitats of medicinal plants;

• morphology of plant organs and their metamorphoses;

• general characteristics of some families, species characteristics, growth conditions, resources, the presence of certain groups of biologically active compounds, the importance and use of medicinal plants, fungi and lichens;

• the value of the herbarium, the rules of collecting herbarium material and making herbarium specimens;

• basic requirements of the current legislation of Ukraine on the use of plant resources; plants that are officially protected in Ukraine.

Be able:

• identify morphological features and describe the vegetative organs of plants and their metamorphosis as a plant raw material;

• dissect and describe the generative organs of plants;

• determine the morphological characteristics of the plant independently and by determinant; characterize medicinal plants by stages of development;

• to recognize medicinal plants of different phytocenoses, as well as on herbarium specimens, photographs and drawings;

• distinguish between poisonous plants, inform the population about the dangerous consequences of their use;

• generalize the obtained results, formulate and argue the conclusions, draw up the results of the study.

Possess:

• botanical terminology;

• skills in compliance with safety measures;

• methods of morphological analysis, visual observation, identification, identification of plants;

• skills of plant propagation and caring for them;

• techniques and skills in the preparation of botanical objects, collection, herbarization and fixation of plant teaching and reference material.

3. The content of the work program

Semantic boundary 1. Purpose, tasks of practice, research methods. Artificial plants grouping.

Topic 1. Content of practice. Methods of botanical, phenological, resource research, safety rules, collection, processing and storage of plant material. The concept of artificial and natural plant groups (phytocenoses).

The purpose and objectives of practice, its content. Safety during practice. Excursion equipment, its purpose. Methods and techniques of plant herbarium; rules of herbarium design, diary keeping; collection, processing and storage of plant material (fixation, drying, etc.); schemes of geobotanical and ecological-morphological descriptions. Characteristics of phytocenoses.

Topic 2. Criteria for plant classification. Plant resources of Ukraine.

Groups of plants by purpose, systematic position, ecological conditions, life form, presence of certain groups of BAS, therapeutic action, etc. Resources of medicinal plants of Ukraine.

Topic 3. Cultivated plants, their reproduction. Segetal and quarantine weeds.

Introduction, acclimatization, cultivation of open ground plants. Species composition, morphological features, significance and use of food, spicy-aromatic and medicinal plants (genera apricot, anise, chokeberry, artichoke, eggplant, grapes, pumpkin, hibiscus, mustard, buckwheat, Dioscorea, Eleutherococcus, Echinacea, ginseng, watermelon, cabbage , potatoes, beans, cumin, coriander, dill, corn, lavender, lemongrass, flax, lovage, mint, poppy, raspberry, madder, lemon balm, almonds, carrots, foxglove, sea buckthorn, oats, orthosyphon, parsnips, peppers, peach , parsley, peony, late flower, podophilus, tomato, wheat, rhubarb, radish, radish, rice, castor, rhodiola, rosemary, milk thistle, currant, licorice, sophora, stevia, Jerusalem artichoke, fennel, chamomile, onion, tea, cherry , sage, sorrel, apple, etc.).

Weeds as a special ecological group of plants, principles of classification, control measures. Definition, biological features of segetal and quarantine weeds used in medicine

(genera ragweed, cornflower, burkun, bitter gourd, evening primrose, nightshade, wheatgrass, coltsfoot, root, horsetail).

Topic 4. Greenhouse, houseplants, their reproduction.

The specifics of growing plants in a greenhouse. Variety of greenhouse and houseplants, their origin, features of ecological and morphological structure. Rules and methods of reproduction and care of houseplants. Importance and use of medicinal greenhouse and houseplants in pharmacy, medicine (genera yucca, agave, aloe, pineapple, pomegranate, eucalyptus, ginger, coffee tree, kalanchoe, catharanthus, laurel, lemon, olive, oleander, passionflower, ivy, raffia, raffia, ruscus, fig tree, etc.).

Topic 5. Artificial plant systems of botanical gardens.

Structure and composition of systematic and pharmacognostic sites, demonstration expositions of botanical gardens. Significance and use of species in pharmacy, medicine and other fields. Protected representatives (astragalus shertistokvitkovy, belladonna ordinary, ginkgo biloba, peony, lavender, rhodiola rosea, scopolia carniola, yarrow spring, yarrow yellow, etc.).

Topic 6. Tree and shrub vegetation of the city. Ruderal weeds.

Features of development and adaptation of plants to urban conditions. Sanitizing role of urban plants. Species composition of plants in squares, parks, streets, etc. Examples of medicinal plants (genera amorphous, birch, barberry, elderberry, witch hazel, bitter chestnut, rowan, oak, walnut, viburnum, caragana, laurel, larch, securinega, sumac, pine, sumac, poplar, dog rose, fir, etc.).

Species composition and biological features of ruderal weeds, measures to control them. Significance and use in the pharmacy of weeds (genera dandelion, nettle, buckthorn, weed, burdock, nightshade, tansy, plantain, wormwood, dog nettle, knotweed, hops, celandine, anchors, etc.)

Semantic boundary 2. Natural plant groups.

Topic 7. Vegetation of forest phytocenoses.

Definition of "forest". Types, structure, ecological features of forest phytocenoses. Species composition and ecological and morphological features of forest plants. Medicinal plants of evergreen coniferous forests (genera pear, larch, sleep, pine, blueberry, cumin, spruce, fir, juniper, etc.), deciduous deciduous and mixed (genera periwinkle, birch, cranberry, cranberry, beech, elderberry, alder, willow, veronica , spring, elm, carnation, hawthorn, rowan, hornbeam, pear, bells, oak, angelica, hornbeam, St. John's wort, stars, asterisk, goldenrod, viburnum, sourdough, maple, lily of the valley, stone fruit, nettle, buckthorn, bush, linden , hazel, lyubka bifoliate, oregano, medunka, blackberry, aspen, primrose, foxglove, snowdrop, snowdrop, rust, strawberries, thorns, celandine, apple, ash, etc.), ferns (dryopteris, orlyak), horsetails, plauns (plaunok plaunopodobny, plaun lamb), mosses, mushrooms (pale toadstool), lichens. Medicinal plants and fungi of forests listed in the Red Book of Ukraine (late autumn, colorful, annual clown, sublingual ruscus, carniola scopolia, cedar pine, yew, bear onion, etc.). Parasites and semi-parasites of trees (mistletoe, chaga, larch sponge, Peter's cross, etc.). Significance and use of representatives in pharmacy, medicine and other fields.

Topic 8. Vegetation of reservoirs and coastal zone.

Features of living conditions, tiers. Ecological groups of aquatic plants. Value.

Hydatophytes - plants completely or for the most part immersed in water (rdesnik, elodeya, kushir, puhirnik), with floating leaves, rooted (jugs yellow, white water lilies), which do not take root (duckweed, salvinia) in the soil; algae (spirogyra, cladophora, spirulina).

Hydrophytes - plants of the coastal zone (genera kalyuzhnytsya, rozhiz, reed, chastukha, kuga, hedgehog's head, arrowhead, susak, hemlock, nightshade, omega).

Hygrophytes - a transitional type from wet places of growth to medium-wet (marsh marsh, valerian, alder, comfrey, viburnum, ergot, etc.);

Significance and use in pharmacy and medicine of representatives of coastal-aquatic vegetation (legume, valerian, alder, yellow jugs, viburnum, alder, herd, etc.). Plants listed in the

Red Book of Ukraine (spring white flower, floating water nut, small-fruited cranberry, small hornbeam, floating salvinia, thyme, common thyme, etc.).

Topic 9. Meadow-steppe vegetation.

Definition of "meadows", "steppes". Characteristics of meadows of different types (floodplain, land, mountain). The composition of vegetation of meadows and steppes on a systematic and economic basis: cereals (feather grass, fireweed, cattail, broom, timothy, tonkonig, pike, etc.), legumes (wolf, pea, sainfoin, clover, alfalfa, ladvenets, peas, rank, etc.) , weeds (genera of marshmallow, geranium, buttercup, goatweed, coronary, dandelion, hatma, ergot, butterbur, butterbur, witch hazel, rootstock, daredevil, scabies, licorice, dried flowers, thyme, etc.), sedges. Medicinal types of onions (genera valerian, cornflower, bitter gourd, yarrow, cumin, carrot, violet, chicory, sorrel, sage, etc.), their use. Protected plants of meadows and steppes (spring mustard, tall dolphin, feather grass, yellow cattail, late autumn flower, stinky root, sweet naked, meadow dream, spring yarrow, yellow yarrow, etc.).

4. The structure of the discipline

Topic	Number of hours					
	Total	Including				
		lectures	seminars	practical	laboratory	IWS
Topic 1. Content of practice. Methods of botanical, phenological, resource research, safety rules, collection, processing and storage of plant material.						
Topic 2. Criteria for plant classification. Plant resources of Ukraine.						
Topic 3. Cultivated plants, their reproduction. Segetal and quarantine weeds.						
Topic 4. Greenhouse, houseplants, their reproduction.						
Topic 5. Artificial plant systems of botanical gardens.						
Topic 6. Tree and shrub vegetation of the city. Ruderal weeds.						
Topic 7. Vegetation of forest phytocenoses.						
Topic 8. Vegetation of reservoirs and coastal zone.						
Topic 9. Meadow-						

steppe vegetation.						

Topic	Number of hours			
	Total	Including		
		L.	Ave. zan	IWS
Topic 1. Content of practice. Methods of botanical, phenological, resource research, safety rules, collection, processing and storage of plant material.	10.0	0	4.0	6.0
Topic 2. Criteria for plant classification. Plant resources of Ukraine.	10.0	0	4.0	6.0
Topic 3. Cultivated plants, their reproduction. Segetal and quarantine weeds.	8.0	0	2.0	6.0
Topic 4. Greenhouse, houseplants, their reproduction.	8.0	0	2.0	6.0
Topic 5. Artificial plant systems of botanical gardens.	8.0	0	2.0	6.0
Topic 6. Tree and shrub vegetation of the city. Ruderal weeds.	8.0	0	2.0	6.0
Topic 7. Vegetation of forest phytocenoses.	10.0	0	4.0	6.0
Topic 8. Vegetation of reservoirs and coastal zone.	10.0	0	4.0	6.0
Topic 9. Meadow-steppe vegetation.	10.0	0	4.0	6.0
Topic 10 Meadow-forest-steppe vegetation**.**	8.0	0	2.0	6.0
Hours in general	90	0	30	60

5. Topics of lectures / seminars / practical / laboratory classes

5.1. Topics of lectures

Not provided for in the curriculum.

5.2. Thematic plan of practical classes

Not provided for in the curriculum.

5.3. Thematic plan of seminar classes

№ p / p	Topics of practical classes	Number hours
1.	Topic 1. Seminar lesson 1,2. Content of practice. Methods of botanical, phenological, resource research, rules for collecting and fixing plant material.	4
2.	Topic 2. Seminar class 3,4. Plant classification criteria. Plant resources of Ukraine.	4
3.	Topic 3. Seminar lesson 5. Cultivated plants, their reproduction. Segetal weeds.	2
4.	Topic 4. Seminar lesson 6. Greenhouse and indoor plants, their reproduction, care.	2
5	Topic 5. Seminar lesson 7. Artificial systems of botanical garden plants.	2
6.	Topic 6. Seminar class 8. Woody-shrub vegetation of the city, ruderal weeds.	2
7.	Topic 7. Seminar class 9,10. Vegetation of forest phytocenoses.	4

8.	Topic 8. Seminar class 11,12. Vegetation of reservoirs and the coastal zone.	4
9.	Topic 9. Seminar class 13,14. Meadow-steppe vegetation.	4
10.	Topic 10. Seminar class 15 Meadow-forest-steppe vegetation.	2
Total		***30***

5.4. Topics of laboratory classes.

Laboratory classes are not provided.

6. Independent work.

№ p / p	Topic name (excursions)	**Number Year**
1.	Topic 1. Content of practice. Methods of botanical, phenological, resource research, rules for collecting and fixing plant material.	4
2.	Topic 2. Criteria for classification of plants. Plant resources of Ukraine.	8
3.	Topic 3. Cultivated plants, their reproduction. Segetal weeds.	8
4.	Topic 4. Greenhouse and indoor plants, their reproduction, care.	8
5	Topic 5. Artificial systems of botanical garden plants.	4
6.	Topic 6. Woody and shrubby vegetation of the city	4
7.	ruderal weeds.	8
8.	Topic 7. Vegetation of forest phytocenoses	4
9.	Topic 8. Vegetation of reservoirs and the coastal zone.	8
10.	Topic 9. Meadow-steppe vegetation.	4
Total		***60***

7. Teaching methods

Practical classes: conversation, solving situational problems, demonstration of collection and procurement of raw materials.

Independent work: independent work with the textbook, independent work with tests.

8. Methods of control and criteria for evaluating learning outcomes

Current control: oral examination, testing, assessment of practical skills, solving situational problems, assessment of activity in the classroom.

Final control: diff. credit, testing.

The university uses various forms of control of classes in a particular discipline (oral, written, combined, testing, practical skills, etc.). The results of students' academic performance are presented in the form of assessment on a national scale, 200-point and ECTS scale and have standardized generalized criteria for assessing knowledge: national scale:

- the grade ***"excellent" is given*** to the student who systematically worked during a semester, showed during examination various and deep knowledge of a program material, is able to successfully carry out tasks which are provided by the program, has mastered the maintenance of the basic and additional literature, has understood interrelation of separate sections of discipline. importance for the future profession, showed creative abilities in understanding and using educational material, showed the ability to independently update and replenish knowledge; level of competence - high (creative);

- a grade of ***"good" is given*** to a student who has shown full knowledge of the curriculum, successfully completes the tasks provided by the program, mastered the basic literature recommended by the program, showed a sufficient level of knowledge of the discipline and is able to independently update and update during further study and professional activity; level of competence - sufficient (constructive-variable);

- the grade ***"satisfactory" is given*** to the student who has shown knowledge of the basic educational program material in the volume necessary for the further training and the subsequent work on a profession, copes with performance of the tasks provided by the program, has made separate mistakes in answers on examination and at performance of examination tasks, but has the necessary knowledge to overcome mistakes under the guidance of a researcher; level of competence - average (reproductive);

- the grade ***"unsatisfactory" is given*** to the student who did not show sufficient knowledge of the basic educational and program material, made fundamental mistakes in performance of the tasks provided by the program, cannot use the knowledge at the further training without the teacher's help, failed to master skills of independent work; level of competence - low (receptive-productive).

The order of assessment of student's educational activity

Current success. Evaluation of the success of studying the topics of the discipline is performed on a traditional 4-point scale.

At the practical (laboratory) lesson students must be interviewed at least once for 2-3 practical (laboratory) lessons (not more than 75% of students), and at the seminar - at least once for 3-4 lessons (not more than 50) % of students). At the end of the semester (cycle) the number of grades for students in the group should be the same on average.

At the end of each lesson, the teacher must announce to students their grades, make an appropriate entry in the Journal of attendance and student performance and Information on the performance and attendance of students.

At the end of the study, the current performance is calculated - the average current score (arithmetic mean of all current grades on a traditional scale, rounded to two decimal places).

At the last practical lesson, the teacher is obliged to provide information to students about the results of their current academic performance and academic debt (if any), as well as when completing the curriculum in the discipline to fill in the student's record book.

To increase the average score in the discipline, the current grades "3" or "4" are not rearranged.

Differential credit is set at the last lesson of the discipline based on the results of the final interview with the mandatory performance by the student of all types of work provided by the working curriculum and evaluated for current educational activities on average not less than 3.00. The grade obtained for the answer on the differential test and the score of the average current performance during the study of the discipline are used to calculate the arithmetic mean, which is the overall grade for the discipline.

In the student's record book the teacher enters the grade in the discipline on the traditional and 200-point scales.

9. Distribution of points received by applicants for higher education

The grade for the discipline is 50.0% from the grade for current performance and 50.0% from the grade for diff credit.

The average score for the discipline is translated into a national grade and converted into scores on a multi-point scale.

Conversion of the traditional grade for the discipline in the 200-point is carried out by the information and computer center of the university program "Contingent".

Table for conversion of traditional assessment into multi-point:

national assessment	Bali
«5»	185-200
«4»	151-184
«3»	120-150

Points from the discipline are independently converted into both the ECTS scale and the four-point scale. ECTS scale scores are not converted to a four-point scale and vice versa. Further accounts are carried out by the information and computer center of the university.

Conversion of traditional assessment in the discipline and the amount of points on the ECTS scale

ECTS assessment	Statistical indicator
«A»	the best 10% of students
«B»	the next 25% of students
«C»	the next 30% of students
«D»	the next 25% of students
«E»	the last 10% of students

The ECTS scale is given by the ONMedU educational subdivision or the dean's office after ranking the grades in the discipline among students studying in one course and in one specialty. According to the decision of the Academic Council, the ranking of students - citizens of foreign countries is recommended to be carried out in one array.

10. Methodical support:

Working program of the discipline
The syllabus of the discipline
Methodical developments for teachers of practical classes №1-№10 (attached).
Methodical recommendations for students on independent extracurricular work №1 - №10 (attached).
Multimedia presentations

List of didactic teaching aids

№ p / p	List of technical and didactic teaching aids (DZH), educational equipment	Notes
1.	Multimedia projector	
2.	Herbariums, raw materials of medicinal plants	
3.	Color images of medicinal plants	
4.	Microscope	
5.	Petri dishes	
6.	Technochemical scales, equilibria	
7.	Test tubes	
8.	Electric stove	
9.	The flasks are different	
10.	The cylinders are different	
11.	Mortar and pestle	
12.	Tripods	
13.	Bottles for solutions	
14.	Chemical reagents	

11. List of questions to diff. offset

1. Define the concepts of "plant ecology" and "geobotany".
2. Name the main groups of environmental factors.
3. Describe the effect of abiogenic factors on plants.

4. Name the main ecological groups of plants that stand out in relation to the conditions of humidification of the environment and describe the features of the morphological and anatomical structure of their organs.
5. Describe the features of the influence of temperature on the growth and development of plants.
6. Name the groups of plants in relation to the intensity of light.
7. Describe the influence of chemical composition and air movement on plant life.
8. Describe the influence of edaphic factors on plant development.
9. Name the main ecological groups of plants that are released depending on the chemical composition of the soil.
10. Describe the influence of orographic factors on plant development.
11. Give examples of plant parasites, semi-parasites, epiphytes.
12. Explain the phenomenon of symbiosis in the plant world.
13. Describe the consequences of positive and negative anthropogenic impact on vegetation.
14. Define the concepts of "introduction" and "acclimatization" of plants.
15. Formulate the concept of "range". Name the types of habitats and factors influencing their formation.
16. Describe the phenomenon of endemism and cosmopolitanism.
17. Formulate the concept of "flora". What floristic areas are distinguished on Earth?
18. Define "phytocenosis". Its formation, structure, signs of classification.
19. Describe the concept of "biocenosis", "biogeocenosis or ecosystem".
20. Formulate the concept: forest, steppe, meadow, swamp. What cultural phytocenoses do you know.
21. Name an example of a multilevel phytocenosis.
22. List the species of medicinal plants of coniferous, deciduous and mixed forests.
23. What is a stand and how to define it. What species is called dominant?
24. Formulate the concept of "projective coverage". As it is determined.
25. What is the physiognomy of the phytocenosis and how to determine it.
26. Name the phenological phases of development of herbaceous and woody plants.
27. Formulate the concept of "association", "formation". Give examples.
28. Explain the concept of "vegetation", "biome".
29. Specify the types of vegetation of the Earth.
30. Name medicinal aquatic and wetland plants.
31. Give examples of medicinal, field and roadside weeds. Highlight poisonous weeds and local quarantine weeds.
32. Name the cultivated plants of the field: medicinal, cereals, legumes, cereals, vegetables.
33. Describe the vegetation of floodplain and mainland land and lowland meadows. What medicinal plants germinate on them.
34. What plants of Ukraine are endangered and listed in the Red Book.
35. Which plants of the South of Ukraine are endangered and subject to protection.

12. Recommended reading

Basic

1. Pharmaceutical botany: textbook / T.M.Gontova, A.H.Serbin, S.M.Marchyshyn; edited by T.M.Gontova. – Ternopil: TSMU,2018 p. – 380 p.

2. Shipunov, Alexey. *Introduction to Botany*. January 20, 2020 version. 192 pp. URL: http://ashipunov.info/shipunov/school/biol_154/

3. Gullko R. Explonatory dictionary of medical botany / R.Gullko. – Vinnitsya Publishes “Nova Knyha”, 2006. – 218p.

4. Reddy S.M. University Botany – 3: (Plant Taxonomy, Plant Embryology, Plant Physiology) / S.M.Reddy – New Delhi: New Age International, 2004. – 388 p.

Additionally

1. Pharmaceutical botany: textbook / T. M. Gontova, A. H. Serbin, S. M. Marchyshyn et al.; ed. by T. M. Gontova. - Ternopil: TSMU, 2013. - 380 p.

2. Green pharmacy / Yu. I. Kornievsky, A. I. Panasenko, V. G. Kornievskaya and others. - Zaporozhye: Publishing house ZSMU, 2012. - 642 p.

3. Konovalova, E. Yu. Botanico-pharmacognostic dictionary. Russian-Ukrainian-English-German-French-Latin: studies. manual for students of higher educational institutions and pharmaceutical faculties of medical universities, biological faculties of higher educational institutions of III-IV accreditation levels: - M .: PE “Bludchy MI”, 2010. - 688 p.

4. Pawn, V. P. Pharmaceutical botany: morphology / V. P. Peshka, V. V. Stepanchuk. - Chernivtsi: Medical University, 2013. - 224 p.

5. Razumova, S. T. Plant ecology with the basics of botany and physiology: lecture notes / S. T. Razumova. - Odessa, 2013. - 197 p.

6. Pharmacognostic resource studies with basics introductions of medicinal plants: studies. allowance. for students and pharmacists interns higher honey. and pharmac. studies. institutions of III-IV accreditation levels. 2 e, labor. and report. ed. / V. Mazulin, O. Yu. Konovalova, T. K. Shuraeva and others; / Ed. O. Yu. Konovalova and A. V. Mazulin. - M .: PE “Ludot MI”, 2013. - 200 p.

7. Pharmaceutical encyclopedia / Ch. ed. Council and author of the preface V. P. Chernykh. - 3rd ed. reclaiming and report. - M .: "MORION", 2016. - 1952 p.

8. Phytocosmetology / Yu. I. Kornievsky, V. G. Kornievskaya, S. V. Panchenko, N. Yu. Boguslavskaya; - Zaporozhye: Publishing house of ZSMU, 2016. - 397 with

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2. Materials for independent work of applicants for higher education in the discipline "Pharmaceutical botany", which are posted on the website of the center for distance learning technologies of ONMedU. - Access mode: https://moodle.odmu.edu.ua/course/view.php?id=257

3. The official website of the ONMedU scientific library: https://onmedu.edu.ua/biblioteka/
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