

Azerbaijan Medical University
Teaching methods (Syllabus)
on " Pharmacognosy 1"

"Approved"
chief of Pharmacognosy department
prof. J.I.Isayev

Signature:_____

Date: 14.09.2021

Course Unit Code:

Type of Course Unit:

Semester:

Number of credits:

Mode of Delivery:

Language of Instruction:

Mandatory

V

4

Face to Face

Azerbaijani, Russian, English

Instructor (Lecturer):

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Prerequisites:

In advance for teaching the course, it is necessary to get the course of "Botany-II" and "Botany-II".

Co-Requisites:

It is not necessary to teach another course at the same time as teaching this course.

Description of the Course:

Pharmacognosy, as one of the specialty disciplines, plays an important role in the training of highly educated specialists: bachelors and masters of pharmacy.

The aim of this course is to provide students information about the concept of pharmacognosy, historical background of pharmacognosy, study of raw materials of natural origin (plants, animals, microorganisms, minerals, etc.), chemical composition and classification of medicinal plants, to instill in students the skills of using various methods of pharmacognostic research, necessary for determining the authenticity of medicinal herbs and studying sequential biochemical processes in a plant organism.

In addition, students will be able to gain knowledge for the study of medicinal plants and the various groups of biologically active compounds contained in them, as well as their macro- and microscopic structure, to determine the authenticity and quality of raw materials, to know the rules for the collection, drying, storage of medicinal plant materials, caution, the use of medicinal plant materials and phytoproducts derived from them in pharmaceutical and medical practice.

Students are taught macroscopic and microscopic research of medicinal plants, quality control of medicinal plant raw materials, their standardization, preparation of normative and technical documents.

Objectives of the Course:

Study of medicinal plants: biologically active substances, classification, methods of obtaining physical and chemical properties, distribution in the plant world, including Azerbaijan, the appearance of the medicinal plant and its morphological differences from similar species and plants, ecological features, raw material base.

Practical habits:

During the course, students must master the following skills:

1. To determine the identity of medicinal herbal medicines by microscopic methods.
2. To determine the identity of medicinal herbal medicines by macroscopic method.
3. To determine polysaccharides in medicinal herbal medicines .
4. Carry out qualitative reactions to determine vitamin C in herbal medicines .
5. To determine the amount of essential oils in medicinal herbal medicines by hydrodistillation.
6. To determine the diagnostic features of the anatomical structure of medicinal herbal medicines containing essential oils.
7. To determine the angle of refraction of essential oils.
8. Carry out qualitative reactions related to the determination of phenolic glycosides in herbal medicines .
9. Carry out qualitative reactions for the determination of cardiac glycosides in herbal medicines.
10. Obtain a set of cardiac glycosides from herbal medicines.

Course results:

During the teaching process of this course, students gain the ability to study and use medicinal plants and biological active substances in the treatment and prevention of diseases, which is necessary in their practical activity as a specialist in the future.

Topics of the laboratory training on the course:

N	Topics
1	Mastering the method of macroscopic analysis of plant raw material samples from different morphological groups.
2	Mastering the method of microscopic analysis of samples of medicinal plant raw materials from different morphological groups. Assimilation of histological and identity reactions belonging to different groups of natural biologically active substances.
3	The medicinal plants and herbal medicines , containing polysaccharides. Plantain leaves, Marshmallow root, Coltsfoot leaves, Kelp, Elecampane.
4	Flaxseed, Tragacanth, Apricot gum, Dandelion, Quince, Cotton.
5	The medicinal plants and herbal medicines containing vitamins. Wild rose fruit, Nettle leaves, Calendula flowers, Sea buckthorn, Rowan ordinary, Three-lobe beggartick, Marsh cudweed.
6	Corn stigma, Shepherd's purse leaves, Guelder rose, Black currant, Walnut, Cabbage, Pumpkin, Carrot. The quantitative and chromatographic determination of ascorbic acid in Wild rose and carotenoids in calendula flowers.
7	The medicinal plant and herbal medicines containing essential oils. Coriander fruit, Mint leaves, Melissa(lemon balm) herb, Sage leaves, Caraway fruit.
8	1. Eucalyptus leaves, Valerian rhizome and root and candidate admixture, Chamomile flowers and candidate admixture, Juniper fruits.
9	Camphor getting sources, Santonica flowers, Birch bud, Wormwood herb, Milfoil

	herb.
10	Quiz 1. Thyme herb, Origanum herb, Fennel fruit, Anise fruit, Sweet flag, Arnica, Marsh Labrador tea (Wild rosemary). The analysis of essential oils.
11	Medicinal plants and raw materials containing thioglycosides, cyanoglycosides and bitter substances (iridoids). Mustard seeds, Bitter almond seeds, Centaury grass, Dandelion root, Hop fruits.
12	Medicinal plants and raw materials containing phenolic glycosides, lignans and other phenolic compounds. Bearberry leaves, Cowberries leaves, Violet herb, Rosewort (pink rhodiola), Male fern rhizome and its mixtures, Chinese magnolia-vine, Siberian Ginseng, May-apple. Analysis of phenolic glycosides.
13	Medicinal plants and raw materials containing cardiac glycosides. Lily of the valley, Strophanthus seeds, Adonis herb. Digitalis species. Analysis of cardiac glycoside medicinal plant raw materials. Quiz 2

Lecture topics of the course:

1. Pharmacognosy as a science and a teaching subject. Basic concepts; medicinal plants, medicinal plant raw materials, animal raw materials, biologically active substances. Relation of pharmacognosy with specialties and other related disciplines. The position of pharmacognosy in the practical activity of the pharmacist. Methods of pharmacognostic research of medicinal plant raw materials. Chemical composition of medicinal plants. Biologically active and accompanying substances of medicinal plants. Pathways of biosynthesis of primary and secondary metabolites. Changes in the chemical composition of medicinal plants under the influence of environmental factors in the process of ontogeny. Classification systems of medicinal plants: chemical, morphological, botanical and pharmacological.
2. Medicinal plants and raw materials containing polysaccharides, photosynthesis and products of conversion of aqueous carbon were the basis of biogenesis of biologically active substances in plants. Chemical composition, physicochemical properties and medical use of starch, inulin, mucus, adhesives, pectin and cellulose. Vitamins. Distribution in the plant kingdom, dynamics of accumulation in plants, the influence of environmental factors on the accumulation of vitamins, classification, supply.
3. The concept of terpenoids. Essential Oils. General characteristics, classification, physical and chemical properties of essential oils, their distribution in the plant world, localization and role in plant life. Dynamics of accumulation of essential oils in plants. The effect of environmental factors on the accumulation of essential oils. Features of supply, drying and storage of essential oil raw materials, methods of obtaining and analyzing essential oils, their use in medicine. The role of Azerbaijani and foreign scientists in the study of essential oil plants.
4. General characteristics of glycosides, features of their structure, classification. Thio- and nitrile glycosides, phenolic glycosides. Iridoids. Cardiac glycosides. Features of chemical structure, physicochemical properties, classification, distribution in the plant kingdom, raw material sensitivity of vegetation phases and environmental factors. Quality control of cardiac glycoside raw materials, application in medicine.

Assessment Methods and Criteria:

The collection of 100 points required to obtain a credit for the course will be as follows.

Up to 50 points - before the exam

including:

Up to 10 points - attendance

Up to 10 points - free work

Up to 20 points - midterm examination (to be held at the exam center)

Up to 10 points - final examination (to be held at the department).

Up to 50 points - must be collected in the exam.

The exam will be held by test method. Wrongly answered questions delete the points of correctly answered questions.

NOTE:

If a minimum of 17 points is not scored in the exam, the points earned before the exam will not be collected. The points earned during and before the exam are summed and the final amount is evaluated as follows:

A - "Excellent"	-	91-100
B - "Very good"	-	81-90
C - "Good"	-	71-80
D - "Sufficient"	-	61-70
E - "Satisfactory"	-	51-60
F - "Inadequate"	-	less than 51 points

Free works:

Free works are accepted in two ways:

- 2 free work assignments are given during the semester. Completion of each task is evaluated by points. Free work should be in written form, in the form of a word file, 1-2 pages (font 12). At the end of the work at least 3 sources of literature should be indicated.
- Students can also submit free work in the form of PPT. 20-minute presentation around a topic (minimum 20-25 slides).

Completion of the task is estimated at up to 10 points. Plagiarism is unacceptable, since each independent work is a collection of individual student opinions.

In addition to the proposed topics for free work, each student can choose other topics in accordance with the curriculum of the subject.

Topics of free work on the course of Pharmacognosy-1:

1. Method of macroscopic analysis of herbal medicines
2. Method of microscopic analysis of herbal medicines
3. Qualitative reactions of biologically active substances
4. Physico-chemical study of biologically active substances
5. The first metabolites of medicinal plants
6. Secondary metabolites of medicinal plants
7. Medicinal plants and herbal medicines containing polysaccharides
8. Medicinal plants and herbal medicines containing gums
9. Medicinal plants and herbal medicines containing mucous substances
10. Medicinal plants and herbal medicines containing inulin
11. Medicinal plants and herbal medicines containing pectin
12. Types of plantain leaves used in medicine
13. Types of Marshmallow used in medicine
14. Pharmacognostic properties of Coltsfoot
15. Pharmacognostic properties of Kelp
16. Pharmacognostic properties of Elecampane
17. Types of Flaxseed used in medicine
18. Types of Astragalus and their use in medical practice
19. Pharmacognostic properties of Dandelion
20. Pharmacognostic properties of Quince
21. Different types of Cotton and their application in medicine
22. Medicinal plants and herbal medicines containing vitamins
23. Physicochemical properties of vitamins in medicinal plants and their use in medicine
24. Medicinal plants and herbal medicines rich in aliphatic vitamins
25. Medicinal plants and herbal medicines rich in alicyclic vitamins

26. Medicinal plants and herbal medicines rich in aromatic vitamins
27. Medicinal plants and herbal medicines rich in heterocyclic vitamins
28. Provitamins, their importance in medicine
29. Vitamin-like substances and their importance in medicine
30. Types of Wild rose used in medicine
31. Types of Cabbage used in medicine
32. Pharmacognostic properties of Calendula
33. Pharmacognostic properties of Rowan ordinary
34. Pharmacognostic properties of Carrot
35. Pharmacognostic properties of Sea buckthorn
36. Pharmacognostic properties of Nettle
37. Pharmacognostic properties of Common Corn
38. Pharmacognostic properties of Shepherd's purse
39. Pharmacognostic properties of Guelder rose
40. Types of Currants used in medicine
41. Pharmacognostic properties of Marsh cudweed
42. Pharmacognostic properties of Three-lobe beggartick
43. Biogenesis of essential oils
44. Essential oils and their classification
45. Physicochemical properties of essential oils
46. The history of the distribution and use of essential oils in the plant kingdom
47. Methods of obtaining essential oils from herbal medicines
48. Determination of identity and quantity of essential oils
49. Application of essential oils in medicine
50. Medicinal plants and herbal medicines containing acyclic monoterpenes
51. Medicinal plants and herbal medicines containing monocyclic monoterpenes
52. Medicinal plants and herbal medicines containing bicyclic monoterpenes
53. Medicinal plants and herbal medicines containing sesquiterpenes
54. Medicinal plants and herbal medicines containing aromatic compounds
55. Rose types used in medicine
56. Pharmacognostic properties of Peppermint
57. Pharmacognostic properties of Sweet flag
58. Pharmacognostic properties of Coriander
59. Pharmacognostic properties of Lavender
60. Pharmacognostic properties of Melissa(lemon balm)
61. Chemical composition of Lemons and other citrus plants and their use in medicine
62. Types of Sage used in medicine
63. Types of Eucalyptus used in medicine
64. Pharmacognostic properties of Caraway
65. Pharmacognostic properties of Common tansy
66. Pharmacognostic properties of Valerian
67. Pharmacognostic properties of Juniper
68. Pharmacognostic properties of Camphor
69. Medical study of Pine plants
70. Pharmacognostic properties of Arnica
71. Pharmacognostic properties of Marsh Labrador tea (Wild rosemary)
72. Types of Birch used in medicine
73. Pharmacognostic properties of Wormwood
74. Medical research of Santonica
75. Pharmacognostic properties of Milfoil
76. Pharmacognostic properties of Cumin
77. Pharmacognostic properties of Fennel

78. Types of Thyme used in medicine
79. Pharmacognostic properties of Origanum
80. General characteristics of glycosides, features of their structure, classification and distribution in the plant kingdom
81. Medicinal plants and herbal medicines containing thioglycosides
82. Medicinal plants and herbal medicines containing cyanoglycosides
83. Pharmacognostic properties of ordinary almond
84. Pharmacognostic properties of Sambucus
85. Pharmacognostic properties of Garlic
86. Pharmacognostic properties of Onion
87. Pharmacognostic properties of Sarept mustard
88. Iridoids (bitter substances), biogenesis, classification, physicochemical properties and medical research
89. Pharmacognostic properties of Centaury
90. Pharmacognostic properties of Hop
91. Pharmacognostic properties of Tree of heaven (ailanthus)
92. Phenol compounds, their classification and distribution in the plant kingdom
93. Medicinal plants and herbal medicines containing phenolic glycosides
94. Pharmacognostic properties of Common Bearberry
95. Pharmacognostic properties of Cowberries
96. Pharmacognostic properties of cultivated Artichoke
97. Pharmacognostic properties of Male fern
98. Pharmacognostic properties of Rosewort (pink rhodiola)
99. The use of plants of the Violet genus in medicine
100. Lignans, their classification, physical and chemical properties and distribution in the plant world
101. Pharmacognostic properties of Chinese magnolia-vine
102. Pharmacognostic properties of Siberian Ginseng
103. Pharmacognostic properties of Mayapple
104. Cardiac glycosides, their classification, physicochemical properties, distribution in the plant world and using in medicine
105. Medicinal plants and herbal medicines containing cardenolides
106. Medicinal plants and herbal medicines containing bufadienolides
107. Digitalis species and drugs derived from them
108. Pharmacognostic properties of Kombe strophanthus
109. Pharmacognostic properties of Adonis
110. Pharmacognostic properties of Lily of the valley
111. Pharmacognostic properties of Erysimum
112. Pharmacognostic properties of Ordinary Oleander
113. Pharmacognostic properties of Periploca graeca (the silkvine)
114. Pharmacognostic properties of Cannabis
115. Pharmacognostic properties of Caucasian Hellebores
116. Classification of terpenoids, their distribution in the plant kingdom and their use in medicine
117. Distribution of starch in the plant kingdom and its importance for pharmacy
118. Basic concepts of pharmacognosy, history of development and importance for medicine
119. Methods of pharmacognostic research of herbal medicines
120. Classification systems of medicinal plants (chemical, morphological, botanical and pharmacological)

Deadline for free works:

The deadline for submission of free work is 1 week before the end of classes. Acceptance of free work should be carried out by teachers outside of classes. Free work submitted after the deadline will not be considered, regardless of the reason. The results of independent work are recorded in the journal.

Course work:

Course work on this subject is not provided.

Practice:

The internship on this subject is intended to strengthen the theoretical material on Pharmacognosy 1 and Pharmacognosy 2 within 21 working days at the end of the VI semester. During this experiment, students get acquainted with a number of wild and cultivated medicinal plants, learn their specific morphological features, growing conditions, the nature of their distribution. During the excursions, students collect samples of raw materials from plants and prepare herbariums.

Text Book / Material / Recommended Resources:***MAIN LITERATURE:*****Azerbaijan section**

1. Kərimov Y.B., Süleymanov T.A., İsayev C.İ., Xəlilov C.S. Farmakoqnoziya, 2010, 741 s.
2. Süleymanov T.A., Kərimov Y.B., İsayev C.İ. Farmakoqnoziya praktikumu, 2017, 676 s.
3. Mühazirə materialı.

Russian section

1. Ковалев В.М., Павлий О.Н., Исакова Т.И. Фармакогнозия с основами биохимии растений. Харьков, 2000, 704 с.
2. Фармакогнозия. Лекарственное сырье растительного происхождения. Под редакцией Г.П.Яковлева 2010, 862 с.
3. Муравьева Д.А., Самылина И.А., Яковлев Г.П. Фармакогнозия. 5-е изд. Москва, «Медицина», 2007, 656 с.
4. Лекционный материал.

English section

1. Evans W.C. Pharmacognosy, 2000, 612 p.
2. Bruneten I. Pharmacognosie (Phytochemie Plant medicinalis). Paris: Technique and documentation, 1999, 1120 p.
3. Kyslychenko V.S. Pharmacognosy, Kharkiv, 2019, 584 p.
4. Lecture material.

ADDITIONAL LITERATURE:

1. İsayev C.İ., Kərimov Y.B., Əliyeva S.Ş. və d. Farmakoqnoziya 1 test tapşırıqları, Bakı, 2018, 563 s.
2. İsayev C.İ., Qocayeva F.Ə. Dərman bitkilərinin ehtiyatşünaslığı. Bakı, 2011, 91 səh.
3. İsayev C.İ. Tərkibində antrasen törəmələri olan dərman bitkiləri və xammalları. Bakı, 2009, 70 səh.
4. İsmayılova T.N., Xəlilov C.S. Tərkibində vitaminlər olan dərman bitki və xammallar (metodik işləmə), Bakı, 2001, 47 s.
5. Süleymanov T.A. Tərkibində flavonoidlər olan dərman bitkiləri və xammalları. Bakı, 2007, 84 səh.
6. Süleymanov T.A., Aliyeva S.Sh. Medicinal Plants and the herbal medicines , containing polysaccharides. Baku, 75 p.