Azerbaijan Medical University **"Approved"**
Teaching methods (Syllabus) **chief of Pharmacognosy department**
on " Pharmacognosy 1" **prof. J.I.Isayev**
Signature:_____
Date: 14.09.2021

Course Unit Code:	
Type of Course Unit:	**Mandatory**
Semester:	**3**
Number of credits:	**4**
Mode of Delivery:	**Face to Face**
Language of Instruction:	**Azerbaijani, Russian, English**
Instructor (Lecturer):	**prof. J.I.Isayev,** **prof. Y.B, Kerimov,** **associate prof. S.Sh.Aliyeva,** **associate prof. S.E.Aliyeva** **senior teacher E.M.Hajiyeva,** **senior teacher E.H.Kərimli,** **senior teacher A.S.Shukurova,** **senior teacher Z.K.Karimova,** **senior teacher İ.R.Jahangirova,** **assistant X.N.Mustafayeva,** **assistant N.T.Babayeva**
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Prerequisities:

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

Co-Requisities:

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. Providing information on ethnopharmacognosy, biologically active food supplements.

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 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 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 .

Learning Outcomes:
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.

Content of the Course:
1. The subject of pharmacology and its importance for pharmacy. Raw materials of natural origin (plant, animal, mineral).
2. Methods of pharmacognostic analysis.
3. Flora of Azerbaijan. Ethnobotany. Pathology.
4. Biologically active substances.
5. Carbohydrates. Mono-, oligo- and polysaccharides. Medicinal plant raw materials containing polysaccharides.
6. Vitamins. Medicinal plant raw materials containing vitamins
7. Lipids. Fatty oils. Prostaglandins. Medicinal plant raw materials containing fatty oils.
8. Proteins. Enzymes.
9. Quality control of raw materials of natural origin. Standardization.

Content of the laboratory classes of the Course:

N	The topics
1	The subject of pharmacognosy. Methods of pharmacognostic analysis. Preparation, collection, drying and storage of MPM. Contamination.
2	Macroscopic analysis. Commodity analysis. Definition of unknown raw materials with the help of guidance.
3	Ability to work with a microscope. Microscopic analysis. Determination of unknown raw materials using guidance.
4	Phytochemical analysis. Extraction methods. Primary and secondary plant metabolites.

	Biologically active substances
5	Carbohydrates Plantago spp., Althea officinalis, Tussilago farfara, Laminaria officinalis, Orchis L., Verbascum phlomoides, Inula helenium.
6	Linum ustitassimum, Gummi Tracaganthae, Gummi armenica, Taraxacum officinalis, Cydonia oblonga, Gossypium.
7	Vitamins. Rosa spp., Urtica dioica, Calendula officinalis, Hyppophae rhamnoides, Sorbus aucuparia.
8	Vitamins. Bidens tripartita, Gnaphalium uliginosum, Zea mays, Capsella bursa pastoris, Ribes nigrum, Viburnum opulus, Junglans regia, Brassica oleracea, Cucurbita pepo, Daucus sativus.
9	Lipids, their classification, physical and chemical properties, methods of isolation, storage rules, application. Prostaglandins.
10	**Quiz 1**
11	Lipids. Acquaintance with medicinal products and herbaria. Vegetable oils.
12	Monographs. Pharmacopoeia. Quality control of raw materials of natural origin. Standardization. Search for literature data.
13	**Quiz 2**

Content of the lectures of the Course:

N	The topics
1	Pharmacognosy and its importance for pharmacy. Raw materials of natural origin (plant, animal, mineral).
2	Medicinal plants, medicinal plant raw materials. Wild and cultivated medicinal plant raw materials. Supply. Circulation.
3	Flora of Azerbaijan. Ethnobotany.
4	Methods of pharmacognostic analysis. Extraction methods. Chromatographic analysis. Separation and identification of individual substances.
5	Primary and secondary plant metabolites. Biologically active substances.
6	Carbohydrates, structural features, classification, physical and chemical properties, methods of isolation, storage, application. Mono- and oligosaccharides. Medical use of polysaccharides obtained from fungi and microorganisms.
7	Homopolysaccharides. MP containing homopolysaccharides. Heteropolysaccharides. MP containing heteropolysaccharides.
8	Vitamins, their classification. MP containing vitamins.
9	Lipids. Fatty oils, structural features, classification, physicochemical properties, isolation methods, storage, application. Prostaglandins.
10	Lipids. MP containing lipids..
11	Proteins, structural features, classification, physicochemical properties, isolation methods, storage, application. MP containing proteins. Lectins.
12	Enzymes, structural features, classification, physicochemical properties, isolation methods, storage, application. MP containing enzymes.
13	Resource studies. Quality control of raw materials of natural origin. Standardization.

Assessment Methods and Criteria:

The collection of 100 points required to obtain a credit for the cource 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 independent work, each student can choose other topics in accordance with the curriculum of the subject.

Topics of free work:

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. Distribution of starch in the plant kingdom and its importance for pharmacy
44. Classification systems of medicinal plants (chemical, morphological, botanical and pharmacological)
45. Lipids, classification
46. Fatty oils
47. Physical properties of fatty oils
48. Chemical properties of fatty oils
49. Prostaglandins
50. Analysis of lipids
51. Pharmacognostic properties of the European Olive
52. Pharmacognostic properties of Almond
53. Pharmacognostic properties of Peach
54. Pharmacognostic properties of Linseed
55. Pharmacognostic properties of Pumpkin
56. Pharmacognostic properties of Castor
57. Pharmacognostic properties of Sesame
58. Pharmacognostic properties of Cocoa
59. Pharmacopoeial indicators of medicinal plant raw materials
60. Determination of ash in medicinal plant raw materials
61. Determination of extractives in medicinal plant raw materials
62. Determination of impurities in medicinal plant raw materials
63. Determination of organic and mineral mixtures in medicinal plant raw materials
64. Proteins, their classification
65. Enzymes, their classification
66. Pharmacognostic properties of Pineapple
67. Pharmacognostic properties of Papaya
68. Rules for the preparation of certificates for medicinal plant raw materials
69. The structure of the monograph on medicinal plant raw materials in the European Pharmacopoeia
70. Medicinal plants as a source of effective remedies
71. Ethnobotanical research

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.

Cource work:

Course work on this subject is not provided.

Practice: None

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 (metodiki 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.