

**HIGHER EDUCATION OF THE REPUBLIC OF UZBEKISTAN,
MINISTRY OF SCIENCE AND INNOVATION
KOKAND STATE UNIVERSITY**

**BOTANY
SCIENCE CURRICULUM**

Field of Knowledge: 500000 – Natural sciences, mathematics and statistics
Field of Study: 510000 – Biology and related sciences
Type of Study: 60510100 – Biology

Subject/module code B E 1 1 210	Academic year 20 2 4-2025	Semester 1-2	Credits 6/4	
Subject/module type Compulsory	Language of instruction Uzbek/Russian		Weekly class hours 4/4	
1.	Name of science	Auditory training (hours)	Coursework	Independent study (hours)
	Botany	60/60	30	120/30
2. I. The content of science				
<p>The purpose of teaching science is to give students a general understanding of plants, to teach the laws of the structure and functions of plant cells and tissues, their classification, their morphological and anatomical structure, the structure of vegetative and generative organs of plants, methods of reproduction, their importance, the adaptation of plants distributed in different ecological conditions to living conditions, life forms of plants, ontogenesis, seasonal changes, as well as the diversity of the plant world, their description, placement in a certain system (system), and scientific understanding of phylogenetic systems. It is to provide scientific and modern information and knowledge about the widespread divisions, classes, families, orders and species of lower and higher plants, their distribution, and their importance in nature and human life.</p> <p>The task of the subject is to expand, deepen, and systematize the knowledge students have acquired about plants in secondary and secondary specialized schools; to develop their knowledge of morphological and anatomical content; to explain the external structure, shape, individual development (ontogenesis) and historical development (phylogenesis) of plants. To teach and systematize the internal structure of plants, the location and structure of tissues in plant organs, including the microscopic structure of plants, that is, the formation of cells and tissues that make up their organs, their historical development in relation to the external environment ; to classify plants; to develop knowledge of taxonomy, nomenclature, and phylogenetic content; to expand their ideas about taxonomic units and phylogenetic systems on a scientific basis; to acquire information about comparative-morphological, embryological, comparative-anatomical, and ontogenetic methods, prokaryotes, and eukaryotes; to classify and vital to teach students the processes .</p>				
II. Main theoretical part (lectures)				
II.I. The subject includes the following topics:				
<p>Topic 1. Introduction. The plant world and its diversity.</p> <p>The plant world and its diversity. The science of botany and its tasks, departments, history. The importance of green plants in nature and human life. The contribution of Uzbek scientists to the development of botany.</p> <p>Topic 2. Plant cell, its structure, organelles, chemical composition, function of cell membranes, and methods of division.</p> <p>Plant cell, its structure, chemical composition, function, and methods of</p>				

division. Biological significance of amitosis, mitosis, and meiosis. Vacuole, cell sap, and inclusions, their chemical composition and function in cell life. Cell membrane and its structure. Changes in the cell membrane, its significance in cell life and production. Cell ontogenesis.

Topic 3. General understanding of tissues and their classification . The structure of connective tissue and their importance. The structure and functions of the main tissue .

General understanding of tissues and their classification. Structure, functions and types of meristem tissue.

Structure and functions of connective tissues. Primary and secondary connective tissues and their importance.

The structure, functions and importance of assimilating (cranial cell structure), spongy, aerenchymal, absorbing, and secretory tissues (nectardons, hydathodes, idioblasts, schizogenous and lysogenous secretory canals).

Topic 4. The structure and importance of vascular tissue in plant life . The structure of mechanical tissue and their significance.

Structure and location of vascular tissue in plant organs, functions, types. Structure of phloem and xylem (wood). General classification of mechanical tissue. Their structure and functions. Collenchyma, sclerenchyma. Sclereids, fibers and their importance.

Topic 5. The structure of the seeds of flowering plants.

The structure of the seeds of flowering plants. Differences in the structure of the seeds of monocotyledons and dicotyledons. The structure of the seed coat. Germination of seeds. The structure of grasses.

Topic 6. Formation, structure, types and functions of the root system. Modified roots, their importance in human and plant life. Primary and secondary anatomical structure of the root.

The main functions of the root, its role in plant life, types and root evolution according to shape and origin. Modified roots, their occurrence, types, importance in human and plant life. The concept of mycorrhiza and nodular bacteria. The primary and secondary anatomical structure of the root, their main differences from each other and their main functions.

Topic 7. General concept of shoots and buds. The emergence, growth and branching of the shoot system . Primary and secondary anatomical structure of the stem. Modified branches and their structure.

General concept of shoot and bud. Stem and its function. Location of leaves on the stem. Origin, growth and branching of the shoot system , Structure of dichotomous, monopodial, sympodial and pseudodichotomous branching and its significance in plant life.

Primary and secondary anatomical structures of the stem, their similarities and differences, the structure of the tree stem.

Subterranean and aboveground metamorphic branches, their origin and significance.

Topic 8. Morphological , anatomical structure and main function of the leaf .

Morphological structure, forms and main function of the leaf. Leaves with a changed shape (metamorphosis). Anatomical structure, types of leaves. Structure of leaves with and without a crass cell. Anatomical structure of leaves of monocotyledonous and dicotyledonous plants.

Topic 9. Asexual and sexual reproduction of plants. Regeneration and reproduction. Reproduction of higher plants by seeds.

Asexual and sexual reproduction of plants, its biological significance. Vegetative reproduction. Methods of natural and artificial vegetative reproduction (propagation) of plants. Reproduction in plants by spores. Sexual reproduction in plants. Gametes and zygotes. Sexual processes and reproductive processes in higher plants.

Sexual processes and reproductive branching in higher plants. Reproduction of open-seeded plants.

Topic 10. Structure, types and functions of a flower.

Structure, types and functions of a flower. Arrangement of flower parts. Flower formula and diagram.

Topic 11. The structure of the Androecium and types .

Microsporogenesis. Structure and types of gynoecium. Megasporogenesis and female gametophyte.

General concept of androecium and microsporogenesis. Structure and types of Chang grains. Structure and types of gynoecium. General concept of megasporogenesis. Megasporogenesis and female gametophyte. Structure of the seed bud.

Topic 12. Inflorescences, their division into types according to their main morphological characteristics.

Inflorescences, their division into types according to their main morphological characteristics, simple and complex inflorescences and their types.

Topic 13. Pollination and fertilization in flowering plants.

Ch. Features of adaptation of flowers to pollination. Biological significance of cross and self pollination. Fertilization in flowering plants. The process of double fertilization and its biological significance. The development cycle of the embryo (bud) of flowering plants.

Topic 14. Structure and diversity of fruits, classification.

Fruits, their structure and diversity, classification. The distribution of seeds and fruits, their specific adaptations.

Topic 15. Adaptations and ecological groups of plants to living conditions. Ontogenesis of flowering plants. Seasonal changes in plants.

Signs of adaptation of plants to living conditions and the structure of their organs. Concept of ecological groups and life forms of plants. Concept of ontogenesis of flowering plants, their development. Seasonal changes in plants. Life span of plants.

Topic 16. Goals and objectives of plant systematics, history.

Thallobionta and higher plants (*Embryophyta*).

Goals and objectives of plant systematics, history. Classification of the

organic world, its practical and theoretical significance. General understanding of lower and higher plants. Taxonomic units and their definition. The importance of evolutionary theories in the development of systematics.

Topic 17. Viruses (*Virophyta*). Bacteria (*Bacteriophyta*), structure, reproduction and classification. Blue-green algae (*Cyanophyta*).

Viruses, bacteria and their cellular structure, reproduction classification, distribution in nature, significance. General description of blue-green algae, specific features of their structure. Reproduction methods, classification. Structure of unicellular *Chlorococcus*, filamentous *Oscillatoria*, colonial *Nostoc* species of the blue-green algae department.

18. Division of green algae (*Chlorophyta*). Division X ara (radian) algae (*Charophyta*). Yellow-green algae (*Xanthophyta*), Pyrrhophyta (*Purrophyta*), Common characteristics of the phylum *Chrysophyta* and Diatoms (*Diatomophyta*) algae.

General definition and specific characteristics of the green algae and kelp sections. Ecological distribution. Specific aspects of development. Classification and important representatives, reproduction and development cycle.

General characteristics of the yellow-green algae department. Ecology, distribution. External and internal structure, reproduction. Important representatives.

Pyrrhophyte, Division of golden and diatom algae (*Purrophyta*, *Chrysophyta*, *Diatomophyta*). General definition and specific characteristics, ecology, distribution, classification. Brief description of the main representatives.

Topic 19 . Red algae division (*Rhodophyta*). Division of brown algae (*Phaeophyta*).

General definition and specific characteristics of the red algae department. Ecological distribution. Specific aspects of development. Classification and important representatives.

Brown algae department. General characteristics. Distribution, internal and external structure. Reproduction methods, classification and description of representatives of the Ascidian order.

Ecology of algae. The importance of algae in nature and human life, their use.

Topic 20. Division of myxomycetes or slimes (*Myxophyta*). Division of fungi (*Mycophyta*, *Fungi*).

Department of myxomycetes or slime molds. Specific aspects of the structure and development cycle. Lifestyle and nutrition. Saprophytic and parasitic myxomycetes (development cycle of cabbage looper), main representatives.

General description of fungi. Vegetative body (hyphae and mycelium). Methods of nutrition of fungi, various forms of reproduction. Classification. Characteristic features of the classes Chytridiomycetes, Oomycetes and Zygomycetes. Body structure. Methods of reproduction. Main representatives.

Topic 21. Classes Ascomycetes and Basidiomycetes . Lichen department (*Lichenes*).

Class Ascomycetes. Their distinctive features. Sexual organs and the sexual

process. Haploid and dikaryon hyphae. Classification of ascomycetes. Definition of the subclass of naked ascomycetes and fruiting ascomycetes. Main representatives, their morphological and biological characteristics.

The class of Basidomycetes, their characteristics and classification. The main orders of the subclass Holobasidiomycetes and their important representatives. The main characteristics of the subclass Phragmobasidiomycetes. The main representatives of the orders of Blackflies and Rusts and their development cycle.

Notochord fungi, main representatives.

Morphology (sticky, foliaceous, shrubby) and anatomical structure of lichens. Distribution and importance.

Topic 22. General description of higher plants. Department of Algae and Rhinophytes.

General definition of higher plants. Compatibility of body structure with the environment. Classification of higher plants. Development cycle and structure of algae. Classification. Class of phylum lycorrhizae. Structure, distribution and development of representatives of the order. Morphological structure of rhiniophytes. Rhiniophytes are the oldest, simplest group of higher plants.

Topic 23. Department of Plaunidae. Department of Centipedes.

Department of Centipedes.

General description, classification, ecology, reproduction and life cycle of the phylum Plaunidae. Class Isoetopsids (Plaunidae).

Division of the centipedes. Structure, distribution and reproduction of representatives of the division. Classification and characteristic features of the main representatives.

Structure, distribution, ecology of the fern department (Fernaceae). Reproduction methods. Development cycles and branching of the genera. Classification and main representatives.

Topic 24. Gymnosperms or Pines.

Gymnosperms or the Pines Department. Characteristic features of their internal and external structure. Development cycle. The seed and its biological significance. Classification. Important representatives of such classes as seed ferns, cycads, cinnamomums, ginkgos, phloxes, and gnetums.

25. Flowering plants. Magnolias and A class like the bear .

Flowering plants. Differences and specific features of flowering plants from archegonial plants. Specific features of the ontogenesis of flowering plants . Classification of flowering plants. Definition of the class of dicotyledons or magnoliaceae.

The order Magnolia, the main representatives of the Magnoliaceae, Laurelaceae, and Liliaceae families, and the specific characteristics of the magnolia and tulip tree genera.

Acanthocephala, the family Acanthocephala. Important genera and species.

Order of Poppies. Family of Poppies. Characteristic features of the family. Important representatives (poppy, corn poppy, forest poppy, etc.).

Topic 26. Class of Cinnigulkabilir and Rana'kabilir .

The families of the carnations, cactuses, and sedges and their distinctive features. The main representatives of the order, their description.

Order of the Rhynchophyta. Family of the Rhynchophyta. Characteristics of the flower structure. Families and their main groups, important species.

Order Fabales . Family Fabaceae or Fabaceae. *Biological* characteristics and significance of important genera .

The order of caraway, the family of the caraway family. Specific features in the structure of vegetative and generative organs. Definition and importance of the main groups of the family.

Topic 27. The class of the Ironwood family and the Dillenia family .

The structure and significant representatives of the order of oaks and walnuts, the family of maples, birches, and walnuts.

Order of the Asteraceae. Family of the Asteraceae. The families of the family such as cotton, aster, button, and hemp, and their importance. The family of the Mulberry and its representatives. Description of the main families of the Cucurbitaceae family. Order of the Cauliflowers. The family of the Cabbageaceae. Description of the important and main families. Willow order. Systematic classification of representatives of the Willow family. Characteristics of representatives of the willow and poplar families.

Topic 28. Mints and A class of plants like the kokio .

Order of mint. Family of the Asteraceae. Family of the Labiatae. Important characteristics, main genera, their important species, distribution and importance. Systematic characteristics of the family of the Asteraceae. Distribution. Definition of the main genera and species. General definition of the Asteraceae or Tomato family. Definition of the main genera and species. Distribution and specific characteristics, importance.

Order of Asteraceae. Family of Asteraceae, its division into subfamilies. Characteristics of subfamilies, main important species of the order.

Topic 29. Monocotyledons or Class Tulipaceae. Subclass Buddleia.

Subclass Tulips. Subclass Triuriscabidae. Subclass Arecidae.

Monocotyledons or class of tulips. Origin and evolutionary trends of monocotyledons.

Tulip order. The tulip family, its distinctive features, the most common genera of the family, their wild and cultivated species, their specific characteristics , distribution and importance.

Order Narcissus. The onion family and its species, importance.

Order of orchids. Orchidaceae, family of marigolds, characteristic features, vegetative organs, structure of flowers, distribution.

Order of the brown-headed cowbirds. The brown- headed cowbirds or the family of the cowbirds. Main systematic features. Widespread genera, species and their importance.

Order of the Asteraceae. The Asteraceae family, important representatives of the subfamily, and their distinctive features.

Arecidae (Palms) subclass. Order of Palms. Family of Palmate palms. General definition. Important representatives. Importance.

Topic 30. General concept of plant community (*phytocenosis*).

General concept of plant community. Plant cover. Structure and dynamics of phytocenosis and methods of its expression. Introduction and acclimatization of plants.

III. Instructions and recommendations for laboratory exercises

1. Familiarization with the microscope and learning the rules of operation.
2. Study of plant tissues. Structure of covering, mechanical and basic tissues
3. Study the structure of seeds and stems of monocotyledons and dicotyledons.
4. Introduction to the structure of shoots and buds, types of branching. Study of shoot metamorphosis. Study of the anatomical structure of the stem of monocotyledonous and dicotyledonous plants.
5. Study of methods of reproduction in plants. Study of natural and artificial methods of reproduction.
6. Study the structure and types of the anther and gynoecium in a flower .
7. Study of traits in flowers adapted to cross-pollination and self-pollination.
8. Study of the morpho-anatomical structure of plants belonging to different ecological groups. Study of the ontogenesis of annual and perennial plants
9. Morphological study of aquatic and higher plants. Introduction to species belonging to the blue-green algae department.
10. red and brown algae.
11. Identify the systematic characters of the classes Ascomycetes and Basidiomycetes .
12. Identify systematic characters characteristic of the phylum Algae .
13. Study the structure and specific systematic features of gymnosperms. Get acquainted with the development cycle of gymnosperm species.
14. Identify systematic characters characteristic of the families of the Shura, Rana, Burchak, and Zirama .
15. Identify systematic characters characteristic of the families of the tulip, onion, and wheat families .

IV. Instructions and recommendations for practical training

1. Study of the structure of a plant cell.
2. Conductive tissue – introduction to collateral and bicollateral fibrous connective tissue.
3. To get acquainted with the morphological structure of the root. To study the primary and secondary anatomical structure of the root. To get acquainted with the structure of roots with altered shapes.
4. Leaf 's Study of anatomical and morphological structure .
5. Study the structure and parts of a flower. Flower 's Study the formula and diagram .
6. the structure of inflorescences and their types.
7. Getting to know the structure and types of fruits. Studying the adaptations of fruit seeds to dispersal.
8. to the green and brown algae department . Introduction to diatoms and yellow-green algae.

9. To get acquainted with the classes belonging to the Fungi department. To study the species of the classes Oomycetes and Zygomycetes.
10. Identification of systematic characters characteristic of the lichen department
11. Identify systematic characters characteristic of the departments of plauns , centipedes, and centipedes .
12. Magnolias, poppies and identifying systematic characters characteristic of bear-fighting families.
13. Identify systematic characters characteristic of the families of the nut family , the cruciferous family, and the cruciferous family .
14. Friends of the forest , friends of the forest and identification of systematic characters characteristic of the families of relatives .
15. Learning to identify plants.

V. Coursework Instructions and Tips

1. Analysis of the phylogenetic systems of A. Engler and A. Takhtadzhan .
2. The origin and modern classification of representatives of the department of angiosperms.
3. Classification of the gymnosperms or pines department and description of common representatives of the class.
4. Specific characteristics of the sections of higher spore plants .
5. Evolution of plants.
6. Species of the green algae department distributed in Uzbekistan.
7. The importance of algae in wastewater treatment.
8. The importance of algae in nature and human life.
9. Vegetation cover of Uzbekistan and its uniqueness.
10. The law of distribution of plants by region.
11. Relationships between phytocenoses and zoocenoses, their role in the biocenosis.
12. Houseplants and their origin.
13. Methods of propagating houseplants.
14. The structure of representatives of the genus Fungi and their importance in the national economy.
15. Evolution and distribution of fungi.
16. Ecological groups and main representatives of fungi.
17. Fungi that cause diseases in agricultural crops.
18. The role of fungi in human health.
19. Raw material plants and their rational use.
20. Analysis of the differences between higher and lower plants.
21. Endemic plants included in the "Red Book" of Uzbekistan and their description.
21. Rare plants found in our republic and their distribution .
22. Plants growing in the desert region of Uzbekistan and their systematic description.
23. Description of representatives of the family of raccoons distributed in the mountainous region.

24. Shrubs in the vegetation cover of the desert region.
25. Trees and shrubs common in groves and their importance.
26. Vitamin-rich plants scattered throughout the districts .
27. Representatives of the legume family, distributed in mountainous and foothill regions, and their importance as feed in livestock farming.
28. Representatives of the legume family, which have medicinal properties.
29. Fruit tree species and their systematic description.
30. Some wild medicinal plants and their reserves .
31. Germination biology of seeds of some plants belonging to the family of Asteraceae.

VI. Independent education and independent affairs

1. The origin of plants and the emergence of organs.
2. Structure and ontogenesis of the plant cell.
3. Structure and types of plastids.
4. Cytoplasm, its chemical composition and physical properties.
5. Mitosis and meiosis processes in plants.
6. Structure and functions of the generative tissue.
7. The structure and importance of connective tissue.
8. Secretory, storage, assimilating tissues.
9. Structure and functions of absorbent tissues.
10. Structure and functions of mechanical and conductive tissues.
11. The structure of seeds of monocotyledonous and dicotyledonous plants.
12. The structure of seeds without endosperm, with endosperm and with perisperm and their germination.
13. Root and its function, types of roots.
14. Primary and secondary anatomical structure of the root.
15. shape .
16. The structure of shoots and buds.
17. Morphological structure of different types of stems .
18. Anatomical structure of stems of monocotyledonous and dicotyledonous plants.
19. Monopodial and sympodial branching of shoots.
20. Branch metamorphosis and its morphological and anatomical structure .
21. Morphological, anatomical structure and function of the leaf.
22. Leaf shedding and its importance for the plant.
23. Sexual reproduction of plants.
24. Types of asexual reproduction.
25. The origin and structure of flowers.
26. The structure, formula of the flower and diagram .
27. Understanding androecium. Structure and development of the sporangium (microsporogenesis).
28. The concept of the gynoecium, its structure and function.
29. The structure and types of the seed bud.
30. Inflorescences. Their structure and types.

31. Features of adaptation of flowers to external pollination.
32. The process of pollination and fertilization.
33. Structure and types of fruits.
34. Methods of fruit and seed dispersal.
35. Ecological groups of plants according to light and humidity factors.
36. plant life forms
37. Classification of herbaceous plants.
38. Morpho-anatomical structure of plants belonging to different ecological groups .
39. annual and perennial plants.
40. Seasonal changes in plants.
41. Modern phylogenetic system.
42. Tropical plants and their classification.
43. Galling of generations in tuberous plants.
44. General description of the green algae department, cell structure and methods of reproduction.
45. Characteristic signs and classification of the class of conjugators or matadors. Representatives of the order of Zygematidae.
46. General characteristics of the department of ciliated or luminous algae, classification, main representatives, methods of reproduction.
47. The importance of algae.
48. General understanding of the moss department, its characteristics, and classification.
49. Class of liverworts, main characteristics, development cycle of marshansia.
50. Funaria moss.
51. General understanding of the water centipede, its distribution and development.
52. General characteristic reproduction methods of the class Chytridiidae.
53. General characteristics of the class of immature fungi, main representatives.
54. General characteristics, importance, and representatives of the class of ascomycetes or ascomycetes.
55. General characteristics of the lichen department, the structure and types of thallus, their importance in nature and the national economy.
56. Analysis of the cycle of higher spore plants.
57. Characteristics, reproduction and distribution of the division Gymnosperms (pines).
58. Specific systematic features of the representatives of the family of bear cubs, their main representatives and their importance in the national economy.
59. Systematic features of the Poppy family: main genera and species, distribution and importance.
60. The main orders and species of the family Ranidae. The main orders and species of the subfamily Namatacidae.

3 .	<p>VII. Results of science teaching (developed competencies)</p> <p>As a result of mastering the subject, the student will:</p> <ul style="list-style-type: none"> • Cellular structure of plants, classification of tissues, morphological and anatomical structures of vegetative organs, asexual, sexual and vegetative reproduction of plants, morphological structure of generative organs, structure and types of inflorescences, pollination and fertilization processes in plants, structure and types of fruits, classification of life forms of plants, morpho-anatomical structure of plants belonging to different ecological groups, ontogenesis of plants, systematics of lower and higher plants, their main systematic groups, family, order and species ; (knowledge) • Based on the knowledge acquired, students will be able to analyze and apply in practice the following issues: cellular structure of plants, tissue classification, morphological and anatomical structures of vegetative organs, asexual, sexual and vegetative reproduction of plants, morphological structure of generative organs, structure and types of inflorescences, pollination and fertilization processes in plants, structure and types of fruits, classification of plant life forms, morpho-anatomical structure of plants belonging to different ecological groups, specific features of plant ontogenesis, systematic groups on a scientific basis, study various physiological processes occurring in plants, and correctly determine the specific characteristics, distribution, and importance of sections, classes, families, orders and species in nature and in the national economy based on the theoretical and practical knowledge acquired based on the systematic signs <i>of plants widespread in Uzbekistan</i>; (skill) • The student has the skills to study the cellular structure of plants and analyze them anatomically, analyze asexual, sexual and vegetative reproduction of plants, based on the morphological structure of vegetative and generative organs, the process of pollination and fertilization in plants, the structure and types of fruits, the classification of plant life forms, the morpho-anatomical structure of plants belonging to different ecological groups, the specific <i>features</i> of plant ontogenesis, analyze plants morphologically, anatomically, systematically and physiologically, identify plants, correctly determine the specific features of plant life under different conditions, the laws and regulations of metabolism. must be. (qualification)
4.	<p>VI. Educational technologies and methods:</p> <ul style="list-style-type: none"> • interactive case studies (logical thinking, quick questions and answers); • working in groups; • lectures; • practical training • making presentations; • individual projects; • teamwork and advocacy ; • creating creative works.
5.	<p>VII. To receive credits, students must:</p> <p>Complete mastery of theoretical and methodological concepts of science, the</p>

	ability to correctly reflect the results of analysis, conduct independent observations of the processes and concepts being studied, and complete tasks and assignments given in current forms of control, passing tests for intermediate and final control.
6.	<p>Main literature:</p> <ol style="list-style-type: none"> 1. Dariev A. "Botany" – T.: "Ilm-Ziyo", 2012. Textbook. 2. Toshmukhamedov RI "Practical exercises in plant systematics" – T.: "Uzbekistan", 2006. 3. Tursinbaeva GS, Duschanova GM, Sadinov JS Botany (morphology and anatomy of plants). Textbook. "Tafakkur bo'stoni" publishing house, Tashkent, 2015. 4. Khojanazarov O. "Botany" – T.: "Innovation-Ziyo", 2022. Textbook. 5. Atabaeva H. "Botany (morphology, anatomy, systematics, geobotany)" "Generation of the New Age" 2006 Textbook. <p>Additional literature:</p> <ol style="list-style-type: none"> 1. Isomiddinov Z, "Botany" textbook Science and Technology: T-2023 2. Tokhtayev A. "Fundamentals of Plant Physiology and Microbiology" – T.: "Teacher", 2001. Textbook. 3. Pratov O., Shamsuvalieva L. , etc. " Botany " – T: "Ta'lim Publishing House", 2010. Textbook. 4. Toshmukhamedov RI "Practical exercises in plant systematics" – T.: "Uzbekistan", 2006 <p>Information sources:</p> <ol style="list-style-type: none"> 1 . http://www.ziyonet.uz 1. http://www.natlib.en 2. http://ziyonet.uz