NAVOI STATE UNIVERSITY

BOT11210 BOTANY — COURSE SYLLABUS

Faculty of Natural Sciences - Compulsory course

COURSE PASSPORT & ACADEMIC METADATA

Course Title: Botany (BOT11210)

Course Type: Mandatory (Compulsory)
Field of Study: 100000

Program: 60510100 / 60110900 Biology
Semester: 1 & 2

Form of Education: Full-time

Language of Instruction: English / Uzbek
Total Workload: 180 hrs (Semester 1) / 120 hrs (Semester 2)

Credits: 6.4 ECTS|

Assessment: Examination
Aligned UN SDGs: SDG 15 (Life on Land), SDG 13 (Climate Action), SDG 4 (Quality Education)







1. Course Description & SDG Integration

The Botany course provides a comprehensive scientific foundation in plant biology, encompassing plant cell structure, tissue morphology, organ anatomy, reproductive strategies, systematic taxonomy, and evolutionary development (phylogeny) of lower and higher plants. Given Navoi's unique industrial and desert geographical context, the course embeds the United Nations Sustainable Development Goals—specifically SDG 15 (Life on Land), SDG 13 (Climate Action), and SDG 4 (Quality Education)—by studying plant species adaptation, biodiversity preservation, desertification combat, and regional ecosystem protection.

2. Course Aims (FM) and Objectives

Course Aims (CA):

To provide students with fundamental scientific knowledge of plant biology, cellular and tissue structures, anatomical and morphological organization of vegetative and generative organs, reproduction

methods, and environmental adaptation mechanisms. Furthermore, the course aims to develop systematic understanding of lower and higher plant classification, taxonomic units, phylogenetic systems, and the ecological and socio-economic significance of plants in nature and human life.

Course Objectives:

- Broaden, deepen, and systematize knowledge of plant science gained in secondary and specialized education.
- Explain external plant morphology, individual ontogenetic development, and historical phylogenetic evolution in connection with environmental dynamics.
- Investigate microscopic plant anatomy, tissue differentiation, and organogenesis across diverse ecological habitats.
- Develop skills in plant taxonomy, nomenclature, and systematic grouping using modern dichotomous identification keys.
- Highlight the ecological role of native flora of Uzbekistan, rare and endangered species, and sustainable plant conservation practices.

3. Prerequisites & Intended Learning Outcomes

Prerequisite Knowledge:

Students must possess foundational knowledge in plant anatomy and morphology (Botany BOT111), vegetative/generative organ structures, plant life forms, ontogeny, and basic taxonomic concepts (species, genus, family, class, division).

Intended Learning Outcomes (Course Outcomes):

- Knowledge & Understanding: Master principles of plant cell/tissue structure, organ anatomy, reproductive methods, life forms, and adaptation features in varied ecological environments.
- Systematics & Taxonomy: Demonstrate deep understanding of lower and higher plant systematics, contrasting characteristics, and taxonomic units used in Uzbekistan and global flora.
- Analytical Skills: Analyze plant morphological and anatomical structures, vegetative/generative organs, and reproductive mechanisms under laboratory conditions.
- Species Identification: Differentiate lower and higher plant groups, families, genera, and species using diagnostic morphological keys and scientific analysis.
- SDG Competencies: Apply botanical knowledge toward biodiversity conservation (SDG 15), climate adaptation analysis (SDG 13), and environmental education.

4. Course Structure & Hours Allocation

Activity Type	Semester 1 (Hours)	Semester 2 (Hours)	Total Hours
Lectures	36	24	60
Laboratory Classes	36	24	60
Practical Classes	18	12	30
Independent Study	90	60	150
Total Workload / Credits	180 Hours	120 Hours	300 Hours (6.4 ECTS)

5. Detailed Course Content & Curriculum Outline

5.1 Lecture Syllabus Outline (Semester 1 & 2)

• **L1: Introduction to Botany & Systematics History:** Introduction to lower and higher plants, history of botanical taxonomy, basic principles of plant classification.

• **L2: Algae Overview & Chlorophyta:** General characteristics, reproduction, distribution, and taxonomy of Algae. Green algae (Chlorophyta) division.

• **L3: Xanthophyta, Diatomophyta, Phaeophyta & Rhodophyta:** Characteristics of Yellow-Green, Diatom, Brown, and Red algae divisions.

• **L4: Mycophyta (Fungi) Division:** General review of Fungi. Characteristics of Zygomycetes, Ascomycetes, and Basidiomycetes classes.

• **L5: Lichenes Division & Higher Plant Introduction:** Lichen morphology and ecology. Introduction to higher plants: Bryophyta and Lycopodiophyta divisions.

• **L6: Equisetophyta & Polypodiophyta Divisions:** Morphology, life cycles, and taxonomy of Horsetails (Equisetophyta) and Ferns (Polypodiophyta).

• **L7: Gymnosperms / Pinophyta:** General overview, reproductive biology, and economic/ecological importance of Conifers (Pinophyta).

• **L8: Angiosperms / Magnoliophyta (Caryophyllidae):** General taxonomy of flowering plants. Subclasses Ranunculidae and Caryophyllidae.

• **L9: Rosidae Subclass & Fabales/Apiales Orders:** Detailed examination of Rosidae, orders Fabales (legumes) and Apiales (umbellifers).

• **L10: Subclasses Dilleniidae, Lamiidae & Asteridae:** Systematics and family key features of Dilleniidae, Lamiidae, and Asteridae.

• **L11: Class Monocotyledones (Liliopsida):** Overview of Monocots. Orders Poales (grasses) and Cyperales (sedges).

• **L12: Plant Communities & Phytocenology:** Concept of phytocenosis, plant community structure, ecological succession, and conservation (SDG 15).

5.2 Practical & Laboratory Syllabus Outline

- Green and Charophyte Algae Microscopy (Chlorophyta, Charophyta)
- Diatom and Brown Algae Structure & Identification
- Fungi Systematics: Ascomycetes and Basidiomycetes Specimen Analysis
- Lichen Anatomy and Environmental Bio-indicator Roles
- Bryophyta, Lycopodiophyta, and Equisetophyta Morphological Analysis
- Gymnosperm Cone, Needle, and Wood Anatomy
- Angiosperm Family Keying: Rosaceae, Fabaceae, Apiaceae, Malvaceae, Chenopodiaceae
- Angiosperm Family Keying: Brassicaceae, Lamiaceae, Solanaceae, Asteraceae
- Monocot Family Keying: Liliaceae, Alliaceae, Poaceae (Gramineae)
- Plant Identification Techniques & Herbarium Specimen Preparation

5.3 Independent Study Topics

- Preparation and microscopic analysis for laboratory classes.
- Translation and critical review of international botanical research literature.
- Essay writing on plant internal/external anatomical adaptations under arid/desert conditions.
- Preparation of scientific conference abstracts and research theses.
- Compilation of diagnostic test items and digital herbarium databases.

6. Assessment Criteria & Grading Policy

Student performance is evaluated using a 5-point grading system based on comprehensive rubrics:

Grade	Performance Criteria & Requirements
Grade 5 (Excellent)	Demonstrates complete mastery of course content, logical scientific reasoning, independent analytical thinking, accurate answers, published scientific abstracts/articles, and flawless execution of practical assignments.
Grade 4 (Good)	Shows solid comprehension of course material with minor non-systematic errors, complete lab notebook preparation, correct answers to theoretical questions, and fulfilled independent tasks.
Grade 3 (Satisfactory)	Possesses basic understanding of core botanical concepts, but exhibits fragmented explanations, imprecise terminology, incomplete independent assignments, or minor logical errors.
Grade 2 (Unsatisfactory)	Unprepared for classes, lack of basic botanical knowledge, severe conceptual errors, copied assignments, or inability to answer fundamental questions.