

BOTANY AND PLANT PATHOLOGY (BOT)

BOT 101. *BOTANY: A HUMAN CONCERN. (4 Credits)

Introductory botany for non-majors, emphasizing the role of plants in the environment, agriculture and society. Includes molecular approaches to the study of plant function and genetic engineering. Lec/lab. (Bacc Core Course)

Attributes: CPBS – Core, Pers, Biological Science

BOT 220. *INTRODUCTION TO PLANT BIOLOGY. (4 Credits)

Introduction to plant biology including an overview of major groups of plants, plant cells and cell types, plant anatomy and architecture, physiology and function, and ecology and the roles of plants in the environment. Laboratory exercises build on lecture themes and provide hands-on learning experiences including field trips. Lec/lab. (Bacc Core Course)

Attributes: CPBS – Core, Pers, Biological Science

BOT 313. PLANT STRUCTURE. (4 Credits)

The structural components of vascular plants and how plant structure relates to function, development, environment, evolution, and human use of plants. Field trip. Lec/lab.

Prerequisites: ((BI 212 with D- or better or BI 212H with D- or better) and ((BI 211 with D- or better or BI 211H with D- or better) or (BI 213 with D- or better or BI 213H with D- or better))) or (BI 205 with D- or better and BI 206 [D-])

Recommended: BI 213 or BI 213H

BOT 321. PLANT SYSTEMATICS. (4 Credits)

Vascular plant classification, diversity, and evolutionary relationships. Lab emphasizes the collection and identification of ferns, gymnosperms, and flowering plants in Oregon. Field trips. Lec/lab.

Equivalent to: BOT 221

Recommended: BI 213 or BI 213H

BOT 322. ECONOMIC AND ETHNOBOTANY: ROLE OF PLANTS IN HUMAN CULTURE. (3 Credits)

Economic and cultural (ethnobotanical) uses of plants and fungi by humans, including domesticated cultivated plants as well as wild-growing plants, and uses of plants and fungi by indigenous cultures. Ecampus course only.

BOT 323. ^FLOWERING PLANTS OF THE WORLD. (3 Credits)

Global perspective of plant biodiversity with a focus on evolutionary origins, classification, and evolutionary relationships of the major groups of plants. Development and application of scientific writing and utilization of online information resources in plant evolutionary biology. (Writing Intensive Course)

Attributes: CWIC – Core, Skills, WIC

Recommended: One year of college biology

BOT 324. *FUNGI IN SOCIETY. (3 Credits)

Explores the diverse roles played by fungi in relation to human civilization and the natural environment. (Bacc Core Course)

Attributes: CSST – Core, Synthesis, Science/Technology/Society

Recommended: One course in biological sciences.

BOT 325. *INTERSECTIONS BETWEEN PLANTS AND HUMANITY. (3 Credits)

The unique attributes of plants—including aspects of their biochemistry, growth, structure, and physiology—have influenced all aspects of life on earth, from biogeochemical cycles to the rise and expansion of human civilizations. Plants are sources of medicines, stimulants, hallucinogens, fibers and woods, resins and latex, oils and waxes; plants have inspired technological innovation, exploration, and exploitation of people and the environment. This course critically examines the intersections of plants with society and technology by exploring the roles plants have played in both historical and modern contexts. (Bacc Core Course)

Attributes: CSST – Core, Synthesis, Science/Technology/Society

Recommended: One course in biological sciences and junior standing.

BOT 331. PLANT PHYSIOLOGY. (4 Credits)

Survey of physiological processes in plants, including photosynthesis and plant metabolism, mineral nutrition and ion uptake processes, plant cell/water relations, regulation of plant growth and development, and transpiration and translocation. Lec/rec.

Prerequisites: ((BI 212 with D- or better or BI 212H with D- or better) and (BI 213 [D-] or BI 213H [D-])) or (BI 205 [D-] and BI 206 [D-]) and (CH 123 [D-] or (CH 233 [D-] and CH 263 [D-]))

Recommended: (BI 213 or BI 213H) and ((CH 123 or (CH 233 and CH 263))

BOT 332. LABORATORY TECHNIQUES IN PLANT BIOLOGY. (3 Credits)

Laboratory experiences in the manipulation and observation of physiological processes in plant systems. Analysis and interpretation of physiological data generated in experimentation with plant systems. Training in basic laboratory skills, including the principles and procedures involved in the use of common items of laboratory instrumentation. Lab.

Recommended: BOT 331 or BI 314

BOT 341. PLANT ECOLOGY. (4 Credits)

Study of higher plants in relation to their environment. The relationship of plant physiology and reproduction to environmental factors; competition and other species interactions; the structure, dynamics and analysis of vegetation. Field trips. Lec/lab.

Recommended: BOT 321 and (BI 213 or BI 213H)

BOT 350. INTRODUCTORY PLANT PATHOLOGY. (4 Credits)

Symptoms, causal agents, diagnosis, and prevention of plant diseases, with emphasis on fungi, bacteria, nematode, and virus pathogens. Lec/lab.

Prerequisites: ((BI 211 with D- or better or BI 211H with D- or better) and (BI 212 [D-] or BI 212H [D-]) and (BI 213 [D-] or BI 213H [D-])) or (BI 204 [D-] and BI 205 [D-] and BI 206 [D-])

BOT 401. RESEARCH. (1-16 Credits)

This course is repeatable for 16 credits.

BOT 403. THESIS. (1-16 Credits)

This course is repeatable for 16 credits.

BOT 405. READING AND CONFERENCE. (1-16 Credits)

This course is repeatable for 16 credits.

BOT 406. PROJECTS: CURATORIAL ASSISTANT. (1-6 Credits)

Students assist with curatorial projects in the OSU Herbarium. Admission is by application to the Department of Botany & Plant Pathology.

This course is repeatable for 6 credits.

BOT 407. SEMINAR. (1 Credit)

Section 1: Departmental seminar. Section 2: Lichens and Bryophytes Research (1). Weekly one-hour meetings for reporting and discussion of active research projects, discussion of proposal research, review and discussion of recent literature, and mini-workshops on particular problems. Normally graded P/N.

Equivalent to: BI 407H, BOT 407H

This course is repeatable for 16 credits.

BOT 407H. SEMINAR. (1 Credit)

Section 1: Departmental seminar. Section 3: Lichens and Bryophytes Research (1). Weekly one-hour meetings for reporting and discussion of active research projects, discussion of proposal research, review and discussion of recent literature, and mini-workshops on particular problems. Normally graded P/N.

Attributes: HNRS – Honors Course Designator

Equivalent to: BOT 407

This course is repeatable for 16 credits.

BOT 408. WORKSHOP. (1-16 Credits)

This course is repeatable for 16 credits.

BOT 410. INTERNSHIP. (1-16 Credits)

This course is repeatable for 16 credits.

BOT 413. FOREST PATHOLOGY. (3 Credits)

Effects of diseases on forest ecosystems. Recognition of important groups, prediction of pathogen responses to environmental changes, and management strategies for protection of forest resources. Field trips. Lec/lab. CROSSLISTED as FOR 413.

Prerequisites: BI 204 with C or better or BI 212 with C or better or BI 212H with C or better or BI 213 with C or better or BI 213H with C or better

Equivalent to: FOR 413

BOT 414. AGROSTOLOGY. (4 Credits)

Classification and identification of grasses, with emphasis on the modern system of grass classification; laboratory practice in keying grass specimens to genus and species. Lec/lab.

Recommended: BOT 321

BOT 416. AQUATIC BOTANY. (4 Credits)

Taxonomy and ecology of aquatic vegetation, emphasizing freshwater and marine algae and the submergent vascular plants. Morphology, physiology, and classification of the algae; morphological and physiological adaptations of aquatic vascular plants; and primary production in aquatic ecosystems. Laboratory practice in the identification of local taxa. Field trips. Lec/lab.

Recommended: BI 213 or BI 213H

BOT 425. FLORA OF THE PACIFIC NORTHWEST. (3 Credits)

Vascular plant identification, terminology, and diagnostic characteristics of plant families. Lab emphasizes the use of keys for identification to the species level and ability to recognize by sight those plant families found in the Pacific Northwest. Field trips. Lec/lab.

Recommended: BOT 321

BOT 440. FIELD METHODS IN PLANT ECOLOGY. (4 Credits)

Concepts and tools for describing, monitoring, and experimenting on vegetation. Combines Web-based material, field experience at the student's location, and student projects.

Recommended: Course in ecology and a course in statistics.

BOT 442. PLANT POPULATION ECOLOGY. (3 Credits)

Ecological aspects of plant form and reproduction; demography and population modeling; species interactions, including competition, mutualism, and herbivory. Lec/lab.

Recommended: BOT 341

BOT 458. ECOSYSTEMS GENOMICS. (3 Credits)

Genomic approaches used to understand species interactions with a focus on plant-associated microbes. Learning the conceptual framework and computational techniques of genomics to study the ecology of plant-microbe interactions at the ecosystem level.

Prerequisites: BI 311 with D- or better and BI 314 [D-]

BOT 460. FUNCTIONAL GENOMICS. (3 Credits)

Functional genomics describes a set of conceptual approaches and associated laboratory techniques that rely on large-scale DNA sequence datasets to investigate the function of, and interactions between, genes as well as their RNA/protein products. This course will provide an overview of these techniques, including a) approaches to predicting protein function based on sequence analysis, b) large-scale genetic approaches to identifying novel genotype-phenotype associations, and c) transcriptomic, proteomic and metabolomic approaches that reveal gene functions by measuring changes in abundance/modification of associated RNA transcripts, proteins and metabolites.

Prerequisites: (BI 311 with C- or better or BI 311H with C- or better) and (BI 314 [C-] or BI 314H [C-])

BOT 461. MYCOLOGY. (5 Credits)

A broad taxonomic survey of the fungi. Topics include life histories, systematics, ecology, genetics, and ethnomycology. Participation on field trips and the submission of a specimen collection are required. Lec/lab.

Recommended: (BI 211 or BI 211H) and (BI 212 or BI 212H) and (BI 213 or BI 213H)

BOT 465. LICHENOLOGY. (4 Credits)

Biology of lichens; includes structure, life histories, classification, and ecology. Field trip fee. Lec/lab. Offered alternate years.

Recommended: (BI 213 or BI 213H) and two botany courses.

BOT 466. BRYOLOGY. (4 Credits)

Biology of bryophytes; includes structure, life histories, classification, and ecology. Field trip fee. Lec/lab. Offered alternate years.

Recommended: (BI 213 or BI 213H) and two botany courses.

BOT 475. COMPARATIVE GENOMICS. (4 Credits)

Principles of comparative genomics. Methods for genome assembly and annotation. Genomic approaches for the study of structural change, whole genome duplication, gene family evolution, gene networks, gene regulation and epigenetics. Lab topics include the analysis of next generation sequencing data and conducting comparative genomic analyses. Lec/lab.

Prerequisites: (BI 311 with D- or better or CSS 430 with D- or better) and BI 314 [D-]

Recommended: Basic working knowledge of cell and molecular biology and genetics

BOT 476. INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES. (3 Credits)

Introduction to management of large datasets (e.g., nucleic acids, protein), computer programming languages, application of basic mathematical functions, and assembly of computational pipelines pertinent to life sciences.

Recommended: Cell and molecular biology or genetics. Familiarity with text editing software and unix/linux operating system is advantageous

BOT 480. PHOTOSYNTHESIS AND PHOTOBIOLOGY. (3 Credits)

Explores the diverse use of light in biological systems, with particular emphasis on photosynthesis. Lectures will discuss the nature of light, light in the natural environment, light absorption in biological systems, use of light energy for photosynthesis, communication, defense, motility, and vision, as well as deleterious effects of light and its use for global monitoring satellite systems.

Recommended: One course in plant physiology or ecology

BOT 488. ENVIRONMENTAL PHYSIOLOGY OF PLANTS. (3 Credits)

Introduces students to mechanisms of plant responses to environmental change caused by humans, including atmospheric, nutrient, water, and global climate factors. Concepts are built around principles of plant environment relations. Lec/lab.

Recommended: One course in plant physiology or one course in ecology.

BOT 499. SPECIAL TOPICS. (0-16 Credits)

Equivalent to: BOT 499H

This course is repeatable for 16 credits.

BOT 499H. SPECIAL TOPICS. (1-16 Credits)

Attributes: HNRS – Honors Course Designator

Equivalent to: BOT 499

This course is repeatable for 16 credits.

BOT 501. RESEARCH. (1-16 Credits)

Graded P/N.

This course is repeatable for 16 credits.

BOT 503. THESIS. (1-16 Credits)

This course is repeatable for 999 credits.

BOT 505. READING AND CONFERENCE. (1-16 Credits)

This course is repeatable for 16 credits.

BOT 507. SEMINAR. (1-16 Credits)

Section 1: Departmental seminar (F, W, S). Section 2: Communication in Ecology (F). Section 3: Community and Habitat Analyses (W). Section 4: Lichens and Bryophytes Research (S). Weekly one-hour meetings for reporting and discussions of proposal research, review and discussion of recent literature, and mini-workshops on particular problems. Graded P/N.

This course is repeatable for 16 credits.

BOT 508. WORKSHOP. (1-16 Credits)

This course is repeatable for 16 credits.

BOT 510. INTERNSHIP. (1-16 Credits)

This course is repeatable for 16 credits.

BOT 513. FOREST PATHOLOGY. (3 Credits)

Effects of diseases on forest ecosystems. Recognition of important groups, prediction of pathogen responses to environmental changes, and management strategies for protection of forest resources. Field trips.

Lec/lab. **CROSSLISTED** as FOR 513.

Equivalent to: FOR 513

Recommended: BI 204 or BI 212 or BI 212H or BI 213 or BI 213H

BOT 514. AGROSTOLOGY. (4 Credits)

Classification and identification of grasses, with emphasis on the modern system of grass classification; laboratory practice in keying grass specimens to genus and species. Lec/lab.

Recommended: BOT 321

BOT 516. AQUATIC BOTANY. (4 Credits)

Taxonomy and ecology of aquatic vegetation, emphasizing freshwater and marine algae and the submergent vascular plants. Morphology, physiology, and classification of the algae; morphological and physiological adaptations of aquatic vascular plants; and primary production in aquatic ecosystems. Laboratory practice in the identification of local taxa. Field trips. Lec/lab.

Recommended: BI 213 or BI 213H

BOT 525. FLORA OF THE PACIFIC NORTHWEST. (3 Credits)

Vascular plant identification, terminology, and diagnostic characteristics of plant families. Lab emphasizes the use of keys for identification to the species level and ability to recognize by sight those plant families found in the Pacific Northwest. Field trips. Lec/lab.

Recommended: BOT 321

BOT 540. FIELD METHODS IN PLANT ECOLOGY. (4 Credits)

Concepts and tools for describing, monitoring, and experimenting on vegetation. Combines Web-based material, field experience at the student's location, and student projects.

Recommended: Course in ecology and a course in statistics.

BOT 542. PLANT POPULATION ECOLOGY. (3 Credits)

Ecological aspects of plant form and reproduction; demography and population modeling; species interactions, including competition, mutualism, and herbivory. Lec/lab.

Recommended: BOT 341

BOT 543. PLANT COMMUNITY ECOLOGY. (3 Credits)

The structure, diversity, and successional dynamics of terrestrial plant communities; methods of analysis. Lec/lab.

Recommended: BOT 341 or equivalent.

BOT 547. NUTRIENT CYCLING. (3 Credits)

Reviews and discusses ecosystem-level biogeochemical concepts for terrestrial and freshwater ecosystems, primarily by reading and discussing classic and current literature to determine the state-of-knowledge and uncertainties associated with it. Topics will include root nutrient uptake mechanisms, soil chemical and biochemical transformations in different soil and ecosystems, measuring soil solution and watershed fluxes, soil organic matter formation and structure, the meaning of sustainability, the concept of N saturation in terrestrial ecosystems, and the use of natural abundance and tracer isotopes in ecosystem biogeochemistry. While forest biogeochemical processes will be emphasized, desert, aquatic, wetland, and prairie ecosystems will also be explored. **CROSSLISTED** as SOIL 547.

Equivalent to: FS 547, SOIL 547

Recommended: College-level chemistry and biology and one class in ecology (eg. BI 370) and/or soils (eg. SOIL 205)

BOT 550. PLANT PATHOLOGY. (5 Credits)

Causal agents of plant disease, diagnosis, pathogenesis, epidemiology, and disease management principles and strategies. Field trip. Lec/lab/rec.

Recommended: BI 213 or BI 213H

BOT 552. PLANT DISEASE MANAGEMENT. (4 Credits)

Analysis of host, pathogen, and environmental factors influencing the increase and spread of plant disease. Epidemiological theory will be used as a basis for developing and evaluating principles and concepts of plant disease management. Lec/lab/rec. Offered alternate years.

Recommended: BOT 350 or BOT 550

BOT 553. PLANT DISEASE DIAGNOSIS. (3 Credits)

Diagnosis of plant diseases and identification of causal agents. Laboratory practice in identification techniques. Observation of symptoms exhibited by diseased plants in greenhouse and field locations. Field trips. Lec/lab. Offered alternate years in summer term.

Recommended: BOT 350 or BOT 550

BOT 554. BIOLOGY OF NEMATODES. (4 Credits)

Survey of basic biology and biodiversity of nematodes. Includes taxonomy, identification, life cycles, ecology and pathology, and interaction with other organisms. Lec/lab. Offered alternate years. *This course is repeatable for 4 credits.*

Recommended: Plant pathology

BOT 556. PHYLOGENETICS. (4 Credits)

Explores the theory and practice of modern phylogenetic analysis. Emphasis placed on tree reconstruction algorithms, assessment of statistical support, and contemporary issues in phylogenetics. Lab will focus on the use of phylogenetic software and the analysis of molecular data sets. Lec/lab.

Equivalent to: BI 556

Recommended: ST 511

BOT 558. ECOSYSTEMS GENOMICS. (3 Credits)

Genomic approaches used to understand species interactions with a focus on plant-associated microbes. Learning the conceptual framework and computational techniques of genomics to study the ecology of plant-microbe interactions at the ecosystem level.

Recommended: BI 311 and BI 314

BOT 560. FUNCTIONAL GENOMICS. (3 Credits)

Functional genomics describes a set of conceptual approaches and associated laboratory techniques that rely on large-scale DNA sequence datasets to investigate the function of, and interactions between, genes as well as their RNA/protein products. This course will provide an overview of these techniques, including a) approaches to predicting protein function based on sequence analysis, b) large-scale genetic approaches to identifying novel genotype-phenotype associations, and c) transcriptomic, proteomic and metabolomic approaches that reveal gene functions by measuring changes in abundance/modification of associated RNA transcripts, proteins and metabolites.

Recommended: (BI 311 or BI 311H) and (BI 314 or BI 314H)

BOT 561. MYCOLOGY. (5 Credits)

A broad taxonomic survey of the fungi. Topics include life histories, systematics, ecology, genetics, and ethnomycology. Participation on field trips and the submission of a specimen collection are required. Lec/lab.

Recommended: (BI 211 or BI 211H) and (BI 212 or BI 212H) and (BI 213 or BI 213H)

BOT 565. LICHENOLOGY. (4 Credits)

Biology of lichens; includes structure, life histories, classification, and ecology. Field trip fee. Lec/lab. Offered alternate years.

Recommended: (BI 213 or BI 213H) and two botany courses.

BOT 566. BRYOLOGY. (4 Credits)

Biology of bryophytes; includes structure, life histories, classification, and ecology. Field trip fee. Lec/lab. Offered alternate years.

Recommended: (BI 213 or BI 213H) and two botany courses.

BOT 570. COMMUNITY STRUCTURE AND ANALYSIS. (4 Credits)

Quantitative methods for the analysis of biotic communities, including community concepts, estimation of community composition parameters, theoretical aspects of multivariate methods of analyzing species-importance data, and overview of multivariate tools; hands-on computer analysis of data sets. Lec/lab.

Equivalent to: BI 570

Recommended: BI 370 and (ST 412 or ST 512) and calculus

BOT 575. COMPARATIVE GENOMICS. (4 Credits)

Principles of comparative genomics. Methods for genome assembly and annotation. Genomic approaches for the study of structural change, whole genome duplication, gene family evolution, gene networks, gene regulation and epigenetics. Lab topics include the analysis of next generation sequencing data and conducting comparative genomic analyses. Lec/lab. CROSSLISTED as MCB 575.

Equivalent to: MCB 575

Recommended: Basic working knowledge of cell and molecular biology and genetics. BI 314 and (BI 311 or CSS 430)

BOT 576. INTRODUCTION TO COMPUTING IN THE LIFE SCIENCES. (3 Credits)

Introduction to management of large datasets (e.g., nucleic acids, protein), computer programming languages, application of basic mathematical functions, and assembly of computational pipelines pertinent to life sciences. CROSSLISTED as MCB 576.

Equivalent to: MCB 576

Recommended: Cell and molecular biology or genetics. Familiarity with text editing software and unix/linux operating system is advantageous

BOT 580. PHOTOSYNTHESIS AND PHOTOBIOLOGY. (3 Credits)

Explores the diverse use of light in biological systems, with particular emphasis on photosynthesis. Lectures will discuss the nature of light, light in the natural environment, light absorption in biological systems, use of light energy for photosynthesis, communication, defense, motility, and vision, as well as deleterious effects of light and its use for global monitoring satellite systems.

Recommended: One course in plant physiology or ecology

BOT 588. ENVIRONMENTAL PHYSIOLOGY OF PLANTS. (3 Credits)

Introduces students to mechanisms of plant responses to environmental change caused by humans, including atmospheric, nutrient, water, and global climate factors. Concepts are built around principles of plant environment relations. Lec/lab.

Recommended: One course in plant physiology or ecology

BOT 590. SELECTED TOPICS IN MYCOLOGY. (1-3 Credits)

Advanced topics in mycology through analysis of current literature. Detailed study of an aspect of mycology beyond those covered in regular classes. Seminar and discussion format.

This course is repeatable for 16 credits.

Recommended: BOT 461 or BOT 561

BOT 599. SPECIAL TOPICS. (0-16 Credits)

This course is repeatable for 16 credits.

BOT 601. RESEARCH. (1-16 Credits)

Graded P/N.

This course is repeatable for 16 credits.

BOT 603. THESIS. (1-16 Credits)

This course is repeatable for 999 credits.

BOT 605. READING AND CONFERENCE. (1-16 Credits)

This course is repeatable for 16 credits.

BOT 607. SEMINAR. (1 Credit)

Section 1. Departmental seminar .
This course is repeatable for 16 credits.

BOT 608. WORKSHOP. (1-16 Credits)

This course is repeatable for 16 credits.

BOT 651. MOLECULAR BASIS OF PLANT PATHOGENESIS. (3 Credits)

Analysis of current concepts in the physiology, biochemistry, and genetics of host-parasite interactions. Topics covered include specificity, recognition, penetration, toxin production, altered plant metabolism during disease, resistance mechanisms and regulatory aspects of gene expression during host-parasite interactions. Offered alternate years.

Equivalent to: MCB 651

Recommended: BOT 550

BOT 668. PLANT DISEASE DYNAMICS. (4 Credits)

Evaluation of processes affecting the dynamics of plant disease and pathogen populations through analysis of current literature. Students will be expected to conduct extensive reading and analysis of literature and to meet with the instructor for small group discussions. Offered alternate years.

Recommended: BOT 550 and ST 412

BOT 691. SELECTED TOPICS-PLANT ECOLOGY. (1-3 Credits)

Recent advances and developing problems in plant ecology, with critical evaluation of current literature. Topics vary from year to year.

This course is repeatable for 99 credits.

Recommended: Graduate-level ecology.

BOT 692. SELECTED TOPICS: PLANT PATHOLOGY. (1-3 Credits)

Selected topics concerning plant pathogens and plant disease processes, emphasizing current literature and theory. Topics vary from year to year.

Equivalent to: MCB 692

This course is repeatable for 99 credits.

Recommended: BOT 550

BOT 699. SPECIAL TOPICS. (1-16 Credits)

This course is repeatable for 16 credits.