

Plant Biology (PB)

PB 103 Perspectives on Botany (1 credit hours)

Orientation to modern botany, including discussions of historical background, relation to other sciences, the nature of modern subdisciplines, professionalism and ethics, local resources of personnel and facilities, educational opportunities, and career possibilities.

Typically offered in Fall only

PB 200 Plant Life (4 credit hours)

An introduction to the structure, processes, and reproduction of higher plants, including the diversity of the plant kingdom and principles of inheritance, ecology, and evolution. Students cannot receive credit for both PB 200 and PB 250.

GEP Natural Sciences

Typically offered in Fall and Spring

PB 205 Our Green World (3 credit hours)

Awareness and understanding of plants in the world for the non-science student. Essential fundamental concepts of plant structure, growth, processes, uses, biotechnology, evolution, environmental issues and ecology. Short field trips will be held that may require students to provide their own transportation. Credit cannot be received for both PB 205 and (PB 200 or PB 250).

GEP Natural Sciences

Typically offered in Fall, Spring, and Summer

PB 208/AEE 208/ANS 208 Agricultural Biotechnology: Issues and Implications (3 credit hours)

Trends and issues of agricultural biotechnology in today's society are addressed while covering the basic biological science behind the technology. Applications of and policy issues associated with plant, animal, and environmental biotechnology used in the agricultural industry are examined from an interdisciplinary approach.

Prerequisite: (BIO 105 or BIO 115 or BIO 181 or BIO 183)

GEP Interdisciplinary Perspectives

Typically offered in Spring only

PB 213 Plants and Civilization (3 credit hours)

This course covers plant use in ancient civilizations, including the economic, social, political, religious, culinary and medical roles of plants and plant products. Plant use in ancient cultures, including but not limited to, Amazonian, Celtic, Chinese, Egyptian, Greek, Inca, Indian, Maya, Mesopotamian, Nubian, Persian, and Roman will be discussed. Topics include foods, beverages, medicines, fibers, construction materials, psychoactive drugs, and religious symbols.

GEP Interdisciplinary Perspectives

Typically offered in Spring only

PB 215 Medicinal Plants (3 credit hours)

Plants and their derived pharmaceuticals in Western medicine and in herbal medicine.

Prerequisite: CH 101 and any one of the following courses: BIO 125, BIO 181, PB 200, ZO 150, ZO 160

Typically offered in Fall only

PB 219 Plants in Folklore, Myth, and religion (3 credit hours)

The structural and functional biology of plants and cultural inclusions in folklore, myth, and religion. The myth/religion-plant-human culture nexus. Mythical and religious themes covered, but not limited to, are: the world tree and cosmic order; plants and the creation of Earth; the unity of plants and divine entities; the tree of life; life-giving waters and human immortality; human descent from plants; origin of food plants from humans; plants of witchcraft and magic; psychoactive plants and access to deities; solidarity between humans and plants; death and resurrection of plants and humans.

GEP Interdisciplinary Perspectives

Typically offered in Fall and Summer

PB 220 Local Flora (3 credit hours)

Structural terminology of vascular plants, field identification of plant species by sight and using taxonomic keys, description of natural community types, including their soil and topographic features. Two Saturday field trips required.

Prerequisite: BIO 105 or BIO 181 or PB 200

GEP Natural Sciences

Typically offered in Fall only

PB 250 Plant Biology (4 credit hours)

An introduction for Life Science majors to the ecology, structure, function, processes, reproduction and evolution of higher plants. Students may not receive credit for both PB 200 and PB 250.

Prerequisite: BIO 181 and BIO 183

Typically offered in Fall only

PB 277 Space Biology (3 credit hours)

Overview of the biology of plants, animals, and humans in the space environment, including gravitational biology, aerospace medicine, astrobiology, search for extraterrestrial life, terraforming, and life support.

Prerequisite: BIO 105 or BIO 181 or BIO 183 or PB 200

GEP Natural Sciences

Typically offered in Fall only

PB 295 Special Topics in Botany (1-4 credit hours)

Trial offerings of new or experimental courses in Botany at the early undergraduate level.

Typically offered in Fall, Spring, and Summer

PB 321 Introduction to Whole Plant Physiology (3 credit hours)

Physiology of higher plants with emphasis on whole plant aspects including structure-function relationships, water and solute movement, energy sources and needs, plant growth and development, and the impact of plant physiology findings on agriculture. Students cannot receive credit for both PB 321 and PB 421.

Prerequisite: (BIO 183 or PB 200 or PB 250) and CH 101/102

Typically offered in Spring only

PB 325 Culinary Botany (3 credit hours)

This course explores the ethnobotany, taxonomic diversity, and unique physical and chemical characteristics of important food and beverage plants used by peoples in different regions of the world. After an introduction to plant domestication and agricultural origins, most course weeks are spent examining the culturally significant edible flora of a different geographic region, combining short lectures on the botany of selected species, discussions about the uses of plant biocultural diversity, and, when feasible, hands-on activities where course participants can sample plant-based foods from each region. One Saturday field trip required.

Prerequisite: CS 213 or HS 201 or PB 200 or PB 250

Typically offered in Fall only

PB 345 Economic Botany (3 credit hours)

This course covers plants of economic importance that have been valued by societies regionally, nationally and globally from the modern era to the present day. Topics include, but are not limited to, plant species used as food, spices, beverages, oils, fibers, paper, dyes, perfumes, body care, construction materials, fuels and ornamentals. Aspects related to the botany and ethnobotany of economically important plant species will be discussed including taxonomy, anatomy, physiology, ecology, conservation, human uses, social and environmental issues, and roles in the economy.

Prerequisite: BIO 181 or PB 200 or PB 250

Typically offered in Spring only

PB 346 Economic Botany Lab (1 credit hours)

This lab course explores plants and plant products of economic importance through hands-on activities. Aspects related to the botany and ethnobotany of economically important plant species will be covered including taxonomy, anatomy, physiology, ecology, conservation, human uses, social and environmental issues, and roles in the economy.

Prerequisite: BIO 181 or PB 200 or PB 250; Co-requisite: PB 345

Typically offered in Spring only

PB 360/AEC 360 Ecology (4 credit hours)

The science of ecology, including factors which control distribution and population dynamics of organisms, structure and function of biological communities, and energy flow and nutrient cycling in ecosystems; contrasts among the major biomes; and principles governing ecological responses to global climatic and other environmental changes.

Prerequisite: C- or better in BIO 181

Typically offered in Fall only

PB 400 Plant Diversity and Evolution (4 credit hours)

Diversity, morphology, taxonomy, and evolutionary history of living and fossil plants including fungi, algae, bryophytes, pteridophytes, gymnosperms, and angiosperms. Two one-day weekend field trips required.

Prerequisite: BIO 181 or PB 200 or PB 250

Typically offered in Spring only

This course is offered alternate even years

PB 403/PB 503 Systematic Botany (4 credit hours)

The course introduces basic and contemporary systematic principles and methods as applied to vascular plants, with emphasis on flowering plants. It covers classification, identification, phylogenetics, and molecular approaches, and surveys important and common plant families representing major groups of vascular plants.

Prerequisite: PB 200, PB 250, BIO 183, Junior standing

Typically offered in Spring only

PB 407/PB 507 Medical Ethnobotany (3 credit hours)

This course covers traditional medical systems from a diversity of ancient and modern cultures, with an emphasis on the medicinal plants utilized within these healing traditions. Humans, as well as a number of other species, have utilized plants and other products from nature to treat their physical and spiritual ailments since prehistoric times. In addition to covering medicinal plant species and their known bioactivity, other topics will include traditional diagnostic techniques, complementary healing modalities, beliefs regarding health and illness, treatment and causes of spiritual diseases, food and spices as medicine, and ethical considerations in ethnobotanical research.

Prerequisite: (BIO 181 or PB 200 or PB 250) and (Junior or Senior)

Typically offered in Spring only

PB 413/PB 513 Plant Anatomy (2 credit hours)

Organelles, cells, tissues and organs of flowering plants and selected gymnosperms. Emphasis placed on developmental patterns and structural adaptations for survival. Laboratory focuses on dissection, histochemistry, and imaging of plant cells and tissues. Students cannot reserve credit for both PB 413 and PB 513.

Prerequisite: PB 200 or PB 250 or PB 321 or PB 421

Typically offered in Spring only

PB 421 Plant Physiology (3 credit hours)

Physiology of higher plants with emphasis on biochemical, cell biological and molecular aspects of how plants function. Unique aspects of regulation of plant metabolism including photosynthesis, respiration, nitrogen fixation, cell wall biosynthesis, growth and stress responses will be emphasized. The course is intended for students interested in postgraduate studies in plant biology. Students cannot receive credit for both PB 321 and PB 421.

Prerequisite: BIO 183 or ZO 160, or PB 200 and CH 220 or CH 221 or CH 225

Typically offered in Fall only

PB 422/PB 522 Methods in Plant Molecular Biology and Physiology (3 credit hours)

This course provides an overview of the methods to characterize the physiology of plants, their genetic composition, and modes for genetic modification. Students will apply core concepts in plant physiology and genetics to real-life biotechnology applications. Emphasis is placed on developing critical thinking skills that are essential for professional plant biologists.

Prerequisite: PB 421 and (GN 311 or PB 480)

Typically offered in Spring only

PB 445/PB 545 Paleobotany (4 credit hours)

Morphologic, taxonomic, geologic and evolutionary relationships of fossil plants; emphasis on vascular plants; discussions of taphonomy, biogeography and palynology. Requires weekend field trips at student expense. Credit will not be allowed for both BO 445 and BO 545.

Prerequisite: BIO 181 or MEA 102

PB 450/PB 550 Plant Ecology (3 credit hours)

This course introduces students to the principles and methods of plant ecology. Topics include how individual plants extract resources from their environments; population dynamics and plant life histories; species interactions in communities; and global change ecology. The course emphasizes distinctive ways that plant natural history affects their ecology while also illustrating how plants can be ideal systems for studying general ecological problems. Undergraduate students gain hands-on ecological experience by gathering real data through field activities, and all students design independent research proposals.

Prerequisite: AEC/PB 360 or FOR 260

Typically offered in Spring only

PB 464/PB 564 Rare Plants of North Carolina (3 credit hours)

This course provides a taxonomic survey of the rare plants of North Carolina, focusing primarily on federally- and secondarily on state-listed species. Particular attention will be placed on: (1) the identification of rare species, their congeners, and morphologically similar species, (2) the biogeography of rare species, (3) optimum survey windows, and (4) the conservation biology of select taxa. Two Saturday field trips required. Junior level or higher. Students cannot receive credit for both PB 464 and PB 564.

Prerequisite: One of the following: (PB 200, PB220, PB 403, or PB 405)

Typically offered in Fall only

PB 480/PB 580 Introduction to Plant Biotechnology (3 credit hours)

Introduction to gene cloning, plant tissue culture and transformation, and the development of agriculturally important transgenic traits. Critical thinking, case studies, and discussions are used to examine global approaches to the regulation and risks of genetically-modified organisms, plant and gene patents, and the consequences of these factors on food sovereignty and trade. Students cannot receive credit for both PB 480 and PB 580.

Prerequisite: BCH 454 or BIT 410 or CS 211 or GN 311 or PB/BIO 414 or PB 421.

Typically offered in Fall only

PB 481/BIT 481 Plant Tissue Culture and Transformation (2 credit hours)

Basic techniques in plant tissue culture and transformation. Empirical approaches to techniques in plant tissue culture, designing transgenes for expression in specific plant cell organelles and tissues, use of reporter genes to optimize transformation, and troubleshooting transformation. Laboratory sessions provide hands-on experience with plant tissue culture and transformation. Use of reporter genes, fluorescence microscopy and digital imaging. Half semester course, first part.

Typically offered in Spring only

PB 488/ECE 488/PB 588/ECE 588 Systems Biology Modeling of Plant Regulation (3 credit hours)

This course provides an introduction to the field of systems biology with a focus on mathematical modeling, gene regulatory network and metabolic pathway reconstruction in plants. Students will learn how to integrate biological data with mathematical, statistical, and computational approaches to gain new insights into structure and behavior of complex cellular systems. Students are expected to have a minimal background in calculus and basic biology. The course will build on these basic concepts and provide all students, regardless of background or home department, with the fundamental biology, mathematics, and computing knowledge needed to address systems biology problems.

Prerequisite: MA 131 or MA 141

Typically offered in Fall only

PB 492 External Learning Experience (1-6 credit hours)

A learning experience in agriculture and life sciences within an academic framework that utilizes facilities and resources which are external to the campus. Contact and arrangements with prospective employers must be initiated by student and approved by a faculty adviser, the prospective employer, the departmental teaching coordinator and the academic dean prior to the experience.

Prerequisite: Sophomore standing

Typically offered in Fall, Spring, and Summer

PB 493 Plant Biology Supervised Undergraduate Research Experience (1-3 credit hours)

This course provides students with a faculty-supervised research experience in Plant Biology that utilizes campus facilities and resources. A minimum of 45 hours of research activity must be completed for each credit hour earned. A maximum number of three credit hours, equivalent to 135 hours of research activity, may be earned per semester. Students must initiate contact and arrangements for research experience with prospective faculty mentors. To enroll, students are required to submit a completed PB 493 course contract that is approved by the faculty mentor and the Director of Plant Biology Undergraduate Programs. Students must submit a written midterm report and give an oral presentation on their research in addition to completing the tasks specified in the approved contract.

Typically offered in Fall, Spring, and Summer

PB 495 Special Topics in Plant Biology (1-4 credit hours)

Offered as needed to present material not normally available in regular course offerings or for offering of new courses on a trial basis.

Typically offered in Fall, Spring, and Summer

PB 501/MB 501/PP 501 Biology of Plant Pathogens (3 credit hours)

Biology of microbes that cause plant diseases. The ecology, genetics, physiology, taxonomy, and mechanisms of parasitism, pathogenicity and virulence of bacteria (and other prokaryotes), fungi (and oomycetes), nematodes, and viruses that cause plant diseases. Prepares graduate students for advanced courses in plant pathology, host-parasite interactions, and provides a knowledge base for students in other disciplines involved with plant pathogens or who seek to broaden their knowledge of microbes.

Prerequisite: PP 315, or PP 318, or an introductory course in microbiology

Typically offered in Fall only

PB 503/PB 403 Systematic Botany (4 credit hours)

The course introduces basic and contemporary systematic principles and methods as applied to vascular plants, with emphasis on flowering plants. It covers classification, identification, phylogenetics, and molecular approaches, and surveys important and common plant families representing major groups of vascular plants.

Prerequisite: PB 200, PB 250, BIO 183, Junior standing

Typically offered in Spring only

PB 507/PB 407 Medical Ethnobotany (3 credit hours)

This course covers traditional medical systems from a diversity of ancient and modern cultures, with an emphasis on the medicinal plants utilized within these healing traditions. Humans, as well as a number of other species, have utilized plants and other products from nature to treat their physical and spiritual ailments since prehistoric times. In addition to covering medicinal plant species and their known bioactivity, other topics will include traditional diagnostic techniques, complementary healing modalities, beliefs regarding health and illness, treatment and causes of spiritual diseases, food and spices as medicine, and ethical considerations in ethnobotanical research.

Prerequisite: (BIO 181 or PB 200 or PB 250) and (Junior or Senior)

Typically offered in Spring only

PB 513/PB 413 Plant Anatomy (2 credit hours)

Organelles, cells, tissues and organs of flowering plants and selected gymnosperms. Emphasis placed on developmental patterns and structural adaptations for survival. Laboratory focuses on dissection, histochemistry, and imaging of plant cells and tissues. Students cannot reserve credit for both PB 413 and PB 513.

Prerequisite: PB 200 or PB 250 or PB 321 or PB 421

Typically offered in Spring only

PB 522/PB 422 Methods in Plant Molecular Biology and Physiology (3 credit hours)

This course provides an overview of the methods to characterize the physiology of plants, their genetic composition, and modes for genetic modification. Students will apply core concepts in plant physiology and genetics to real-life biotechnology applications. Emphasis is placed on developing critical thinking skills that are essential for professional plant biologists.

Prerequisite: PB 421 and (GN 311 or PB 480)

Typically offered in Spring only

PB 545/PB 445 Paleobotany (4 credit hours)

Morphologic, taxonomic, geologic and evolutionary relationships of fossil plants; emphasis on vascular plants; discussions of taphonomy, biogeography and palynology. Requires weekend field trips at student expense. Credit will not be allowed for both BO 445 and BO 545.

Prerequisite: BIO 181 or MEA 102

Typically offered in Spring only

PB 550/PB 450 Plant Ecology (3 credit hours)

This course introduces students to the principles and methods of plant ecology. Topics include how individual plants extract resources from their environments; population dynamics and plant life histories; species interactions in communities; and global change ecology. The course emphasizes distinctive ways that plant natural history affects their ecology while also illustrating how plants can be ideal systems for studying general ecological problems. Undergraduate students gain hands-on ecological experience by gathering real data through field activities, and all students design independent research proposals.

Prerequisite: AEC/PB 360 or FOR 260

Typically offered in Spring only

PB 559 Plant Water Relations (2 credit hours)

Physical and biological mechanisms that govern water uptake, water transport, transpiration, and plant responses to drought; constraints and tradeoffs that limit evolution and artificial selection of drought tolerance; methods for studying water relations. Weekly lecture and paper discussions will draw upon examples from both crop and wild plants.

Typically offered in Spring only

PB 564/PB 464 Rare Plants of North Carolina (3 credit hours)

This course provides a taxonomic survey of the rare plants of North Carolina, focusing primarily on federally- and secondarily on state-listed species. Particular attention will be placed on: (1) the identification of rare species, their congeners, and morphologically similar species, (2) the biogeography of rare species, (3) optimum survey windows, and (4) the conservation biology of select taxa. Two Saturday field trips required. Junior level or higher. Students cannot receive credit for both PB 464 and PB 564.

Prerequisite: One of the following: (PB 200, PB220, PB 403, or PB 405)

Typically offered in Fall only

PB 570 Plant Functional Ecology (3 credit hours)

Mechanisms by which plants interact with their environment, with an emphasis on the role of physiological, morphological, and life history traits, and the evolution of these traits.

Prerequisite: PB/BIO 360

Typically offered in Fall only

PB 575/MB 575/PP 575 Introduction to Mycology (4 credit hours)

A survey of the fungal kingdom in context of phyla and classes. Systematics, ecology, biology and utilization. Illustrative material, cultural techniques in laboratories. Collection and paper required.

Prerequisite: BS 125 or BS 181 and 183 or BO 200 or PP 315 or PP 318

Typically offered in Fall only

This course is offered alternate odd years

PB 580/PB 480 Introduction to Plant Biotechnology (3 credit hours)

Introduction to gene cloning, plant tissue culture and transformation, and the development of agriculturally important transgenic traits. Critical thinking, case studies, and discussions are used to examine global approaches to the regulation and risks of genetically-modified organisms, plant and gene patents, and the consequences of these factors on food sovereignty and trade. Students cannot receive credit for both PB 480 and PB 580.

Prerequisite: BCH 454 or BIT 410 or CS 211 or GN 311 or PB/BIO 414 or PB 421.

Typically offered in Fall only

PB 588/ECE 588/PB 488/ECE 488 Systems Biology Modeling of Plant Regulation (3 credit hours)

This course provides an introduction to the field of systems biology with a focus on mathematical modeling, gene regulatory network and metabolic pathway reconstruction in plants. Students will learn how to integrate biological data with mathematical, statistical, and computational approaches to gain new insights into structure and behavior of complex cellular systems. Students are expected to have a minimal background in calculus and basic biology. The course will build on these basic concepts and provide all students, regardless of background or home department, with the fundamental biology, mathematics, and computing knowledge needed to address systems biology problems.

Prerequisite: MA 131 or MA 141

Typically offered in Fall only

PB 595 Special Topics in Plant Biology (1-4 credit hours)

The study of special problems and selected topics of current interest in plant biology and related fields.

Typically offered in Fall, Spring, and Summer

PB 601 Botany Seminar (1 credit hours)

Weekly seminars on topics of current interest given by resident faculty members, graduate students and visiting lecturers.

Typically offered in Fall and Spring

PB 620 Special Problems In Botany (1-6 credit hours)

Directed research in some phase of botany other than a thesis problem, but designed to provide experience and training in research. Credits Arranged.

Typically offered in Fall, Spring, and Summer

PB 624 Topical Problems (1-4 credit hours)

Discussions and readings on problems of current interest in fields of ecology, anatomy and morphology, taxonomy, plant physiology and cell biology. May be repeated with a change in topic for a maximum of six credits.

Typically offered in Fall and Spring

PB 685 Master's Supervised Teaching (1-3 credit hours)

Teaching experience under the mentorship of faculty who assist the student in planning for the teaching assignment, observe and provide feedback to the student during the teaching assignment, and evaluate the student upon completion of the assignment.

Prerequisite: Master's student

Typically offered in Fall, Spring, and Summer

PB 688 Non-Thesis Masters Continuous Registration - Half Time Registration (1 credit hours)

For students in non-thesis master's programs who have completed all credit hour requirements for their degree but need to maintain half-time continuous registration to complete incomplete grades, projects, final master's exam, etc.

Prerequisite: Master's Student

Typically offered in Fall, Spring, and Summer

PB 689 Non-Thesis Master Continuous Registration - Full Time Registration (3 credit hours)

For students in non-thesis master's programs who have completed all credit hour requirements for their degree but need to maintain full-time continuous registration to complete incomplete grades, projects, final master's exam, etc. Students may register for this course a maximum of one semester.

Prerequisite: Master's Student

Typically offered in Fall, Spring, and Summer

PB 690 Master's Examination (1-9 credit hours)

For students in non-thesis master's programs who have completed all other requirements of the degree except preparing for and taking the final master's exam.

Prerequisite: Master's Student

Typically offered in Fall, Spring, and Summer

PB 693 Master's Supervised Research (1-9 credit hours)

Instruction in research and research under the mentorship of a member of the Graduate Faculty.

Prerequisite: Master's Student

Typically offered in Fall, Spring, and Summer

PB 695 Master's Thesis Research (1-9 credit hours)

Thesis Research.

Prerequisite: Master's Student

Typically offered in Fall, Spring, and Summer

PB 696 Summer Thesis Research (1 credit hours)

For graduate students whose programs of work specify no formal course work during a summer session and who will be devoting full time to thesis research.

Prerequisite: Master's Student

Typically offered in Summer only

PB 699 Master's Thesis Preparation (1-9 credit hours)

For students who have completed all credit hour requirements and full-time enrollment for the master's degree and are writing and defending their thesis.

Prerequisite: Master's Student

Typically offered in Fall, Spring, and Summer

PB 704 Plant Nomenclature (1 credit hours)

A practical foundation in plant nomenclature and nomenclatural references. Emphasis on the evolution of international rules for naming plant taxa and their application in both wild and cultivated plants. Nomenclature applications used in patents, cultivar releases and journal articles. Taught mid-semester. Taught five weeks of semester.

Typically offered in Spring only

PB 733 Plant Growth and Development (3 credit hours)

Advanced course in plant physiology covering plant growth, development, differentiation, senescence and biological control mechanisms.

Prerequisite: PB(ZO) 414 or PB 421, organic chemistry

Typically offered in Spring only

PB 751 Advanced Plant Physiology I (3 credit hours)

Cellular mechanisms and regulatory features related to plant respiration, photosynthesis, sulfur metabolism, nitrogen fixation and metabolism, and signal transduction. One of two courses covering field of plant physiology.

Prerequisite: PB 421

Typically offered in Fall only

PB 761/BCH 761/GN 761 Advanced Molecular Biology Of the Cell (3 credit hours)

An advanced graduate class involving integrated approaches to complex biological questions at the molecular level, encompassing biochemistry, cell biology and molecular genetics. The course will focus on an important, current area of research in eukaryotic biology using the primary scientific literature, and will involve class discussions, oral presentations, and a written research proposal.

Typically offered in Spring only

This course is offered alternate years

PB 774/MB 774 Phycology (3 credit hours)

Introduction to taxonomy, morphology, reproduction and ecological importance of organisms which may be included in the algae. Attention to local freshwater flow and physiology of selected species in relation to algal blooms, water quality and nutrient loading in aquatic habitats.

Typically offered in Spring only

This course is offered alternate odd years

PB 780 Plant Molecular Biology (3 credit hours)

Molecular analysis of plant growth and development. Molecular techniques and their application to understanding control of gene expression in plants.

Prerequisite: BCH 451, GN 411

Typically offered in Fall only

PB 795 Special Topics Botany (1-6 credit hours)

The study of special problems and selected topics of current interest in botany and related fields.

Typically offered in Fall and Spring

PB 801 Seminar (1 credit hours)

Weekly seminars on topics of current interest given by resident faculty members, graduate students and visiting lecturers.

Typically offered in Fall and Spring

PB 820 Special Problems (1-6 credit hours)

Directed research in some phase of botany other than a thesis problem, but designed to provide experience and training in research. Credits Arranged.

Typically offered in Fall, Spring, and Summer

PB 824 Topical Problems (1-4 credit hours)

Discussions and readings on problems of current interest in fields of ecology, anatomy and morphology, taxonomy, plant physiology and cell biology. May be repeated with a change in topic for a maximum of six credits.

Typically offered in Fall and Spring

PB 885 Doctoral Supervised Teaching (1-3 credit hours)

Teaching experience under the mentorship of faculty who assist the student in planning for the teaching assignment, observe and provide feedback to the student during the teaching assignment, and evaluate the student upon completion of the assignment.

Prerequisite: Doctoral Student

Typically offered in Fall, Spring, and Summer

PB 890 Doctoral Preliminary Examination (1-9 credit hours)

For students who are preparing for and taking written and/or oral preliminary exams.

Prerequisite: Doctoral Student

Typically offered in Fall, Spring, and Summer

PB 893 Doctoral Supervised Research (1-9 credit hours)

Instruction in research and research under the mentorship of a member of the Graduate Faculty.

Prerequisite: Doctoral student

Typically offered in Fall, Spring, and Summer

PB 895 Doctoral Dissertation Research (1-9 credit hours)

Dissertation Research

Prerequisite: Doctoral student

Typically offered in Fall, Spring, and Summer

PB 896 Summer Dissertation Research (1 credit hours)

For graduate students whose programs of work specify no formal course work during a summer session and who will be devoting full time to thesis research.

Prerequisite: Doctoral Student

Typically offered in Summer only

PB 899 Doctoral Dissertation Preparation (1-9 credit hours)

For students who have completed all credit hours, full-time enrollment, preliminary examination, and residency requirements for the doctoral degree, and are writing and defending their dissertations.

Prerequisite: Doctoral Student

Typically offered in Fall, Spring, and Summer