

PLS

Plant and Soil Science

PLS 100 AN INTRODUCTION TO HORTICULTURE PROFESSIONS.

(1)

A survey of horticulture as a profession; to inform students of opportunities and to develop an appreciation of horticultural science as it relates to the human environment. Offered on a pass/fail basis only.

PLS 103 PLANTS, SOILS, AND PEOPLE: A GLOBAL PERSPECTIVE.

(3)

Only a few things are essential to life, and food is one of them. What people eat is about what they need to be healthy, what they want to eat (personal preference and culture), and what they have available or can afford to eat. Agriculture plays a vital role in human food security. Many experts feel the world is facing a food supply crisis. Knowledge and application of the principles of plant and soil sciences will have a dramatic effect on human food security, now and into the future, both locally and globally. However, these issues will also be impacted by future human population growth, urbanization, consumer preferences, human decisions regarding civic duties, and climate change. Students successfully completing this course will leave with an understanding of the need to sustainably expand the world's food supply, the basic principles of plant and soil science and their application to this problem, and their own potential role in determining our ability to meet this challenge. Students may not receive credit for both this course and PLS 104.

PLS 104 PLANTS, SOILS, AND PEOPLE: A SCIENCE PERSPECTIVE.

(3)

An introduction to the looming world food crisis and the scientific basis governing our ability to sustainably meet it. The course explores the biological and environmental constraints on food production, the ways that agricultural science has dealt with these in the past and possible ways for the future, as well as societal and cultural issues, such as population growth, human health, education, and food definitions, that also impact food security. Intended for any student interested in these topics. Students may not receive credit for both this course and PLS 103.

PLS 203 HOME HORTICULTURE.

(3)

A general horticulture course encompassing the use of ornamental plants, vegetable and fruit crops, and landscape design for the nonhorticulture major. (May not be used to fulfill horticulture departmental requirements.)

PLS 210 THE LIFE PROCESSES OF PLANTS.

(3)

This course is intended to provide a basic understanding of the natural products and processes that shape the nature of modern plants, and govern their interactions with the environment and characteristics unique to plants, and develop a basic understanding of how these plant attributes relate to organismic function. Emphasis will be placed on exploring the nature of the major plant biomes of the Earth, their community dynamics, and how member plants compete for space and other resources. Development of optimal plant strategies for reproductive success, plant interaction with other living systems as well as abiotic factors and their defense from predation and attack will also be considered.

PLS 220 INTRODUCTION TO PLANT IDENTIFICATION.

(3)

An introduction to the techniques used for plant identification based on over one hundred plants encountered in everyday life. Lecture, one hour; laboratory, four hours per week.

PLS 240 INTRODUCTION TO FLORAL DESIGN.

(3)

The students in this class will be introduced to design theory and basic techniques of floral design. The basic mechanics necessary to follow the principles of floral design will be stressed. Students will also be exposed to the business basics that are necessary to execute a floral design, as well as the global nature of the floral design industry.

PLS 320 WOODY HORTICULTURAL PLANTS.

(4)

A detailed study of evergreen and deciduous trees, shrubs, vines, and ground covers occurring in the landscape; their systematic identification, hardiness, form, growth habit, size, culture, adaptation to environmental conditions, uses, and outstanding horticultural characteristics. Lecture, three hours; laboratory, three hours. Prereq: PLS 220.

PLS 330 HERBACEOUS HORTICULTURAL PLANTS I.

(2)

The identification and cultural requirements of herbaceous plants. A designated number of annuals, perennials, commercial cut flowers, flowering pot plants, bulbs, and foliage plants readily available in the fall will be covered. Lecture, three hours; laboratory, two hours per week for one half semester. Prereq: PLS 220.

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PLS 332 HERBACEOUS HORTICULTURAL PLANTS II. (2)

The identification and cultural requirements of herbaceous plants. A designated number of annuals, perennials, commercial cut flowers, flowering pot plants, bulbs, and foliage plants readily available in the spring will be covered. Lecture, three hours; laboratory, two hours per week for one half semester. Prereq: PLS 220.

PLS 335 DISTILLATION, WINE AND BREWING SCIENCE. (3)

Broad introduction into wine, brewing, and distillation science. Information includes viticulture (growing grapes for wine), wine making (production), wine flavor chemistry, commodities for fermentation, brewing science (beer making to distribution) and distilling. This class is not based on consumption, but rather the combination of science and management strategies needed to produce quality products. A structured vocabulary is associated with production, marketing and distribution of wine, brewing and distilled products. An overarching outcome of this course is that students can describe the chemistry, biology and technology involved in fermented beverages and apply these skills in a problem solving setting. The course will focus on introductory concepts, career paths available and problem solving skills required in each element of the production chain.

PLS 336 INTRODUCTION TO VITICULTURE – GRAPE PRODUCTION. (3)

This class is designed for students interested in pursuing a career in the commercial grape and wine industry. Topics to be discussed include: history of grape production in Kentucky, basic grapevine physiology and anatomy, vineyard design and establishment, important pathogens of grapevines, and economics of grape production. Lecture, three hours per week.

PLS 337 INTRODUCTION TO ENOLOGY: WINE PRODUCTION. (3)

This course is designed to provide students with an understanding of procedures used to produce commercial wines in Kentucky. Topics to be discussed include: the impact of vineyard management practices on wine quality, chemical constituents of wine grapes, production procedures specific to various wine styles using both small and large scale equipment, and economics of wine production. Lecture, three hours per week. Prereq: Must be 21 years of age prior to first day of class.

PLS 340 FLORAL DESIGN FOR LIFE'S EVENTS. (2)

Students will explore the use of flowers in life's events such as weddings, funerals, birthdays and various celebrations. Advanced floral techniques and styles will be taught and executed. The significance of flowers used in events of different cultures will be examined. Prereq: PLS 240 Introduction to Floral Design.

PLS 352 NURSERY PRODUCTION. (3)

An introduction to the production practice of container and field grown nursery stock as they relate to management and operation of a nursery business. A two to three-day field trip is required. Lecture, two hours; laboratory, three hours per week. Prereq or concur: HOR 327 and PLS 465 or consent of instructor.

PLS 366 FUNDAMENTALS OF SOIL SCIENCE. (4)

Study of the physical, chemical and biological properties of soils and how these properties relate to plant nutrient availability and plant growth, land-use planning and management issues, and soil and water quality issues. Lecture, three hours; laboratory, three hours. Prereq: CHE 105.

PLS 386 PLANT PRODUCTION SYSTEMS. (4)

In-depth analysis of the underlying principles of plant production systems. Successful strategies, based on application of the principles developed by lecture and laboratory activities, will be discussed in either agronomic or horticultural contexts. Special attention will be given to minimizing the environmental impact of the plant production techniques employed. Prereq: PLS 210 and PLS 366 or concurrently or consent of instructor. (Same as SAG 386.)

PLS 389 WINE APPRECIATION. (3)

Wine has been produced and enjoyed for thousands of years. It can play an important role in culture, business and social events. While appreciation of wine can be as simple as whether you like a wine, knowledge of the history of wine, aspects of wine aromas and tastes, wine grapes, and winemaking processes opens up a world of deeper enjoyment for experiencing wine. This course will introduce students to these topics plus the major wine producing areas of the world and their wines. The overall goal of the course is to serve as a first step in a life-long journey of learning about and appreciating wines. Prereq: Students must be 21 years of age to enroll.

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PLS 390 AGROECOLOGY.

(3)

A general introduction to ecological principles and processes applied to agricultural ecosystems, including interactions between plants, soils, and animals on population, community and ecosystems scales. Course concepts will be applied to agricultural ecosystems that are of economic importance and ecological significance to the state of Kentucky. Emphasis will be placed on understanding how an ecological perspective can inform sustainable land management, the ecological basis for best management practices, and the interdisciplinary nature of agroecosystem management. (Same as SAG 390.)

PLS 395 SPECIAL PROBLEMS IN PLANT AND SOIL SCIENCE.

(1-4)

May be repeated for a maximum of nine credits. Prereq: Consent of appropriate instructor before registration.

PLS 396 SOIL JUDGING.

(1-2)

This course involves basic soil resource evaluation designed to provide the students with essential field training needed to pursue careers as soil scientists, conservationists, planners, agricultural chemical representatives and environmental assessors. It is also used to prepare the UK soil judging team for regional college competition. May be repeated to a maximum of five credit hours. Prereq: Consent of instructor.

PLS 399 EXPERIENTIAL LEARNING IN PLANT AND SOIL SCIENCE.

(1-6)

A field-based learning experience in plant and soil science under the supervision of a faculty member. May be repeated for a maximum of six credits. Pass/fail only. Prereq: Complete learning contract before registration.

PLS 404 INTEGRATED WEED MANAGEMENT.

(4)

A study of weed management concepts based on the integration of weed biology and ecology data with cultural, biological, and herbicidal control. Lecture, three hours; laboratory, two hours. Prereq: PLS 386.

PLS 406 ADVANCED SOIL JUDGING.

(1)

A more advanced treatment of soil site evaluations under diverse climatic and physiographic environments. Students will obtain expertise in assessing properties of contrasting soil types and rating them for soil use and management suitability. The course is also used for preparing the UK soil judging team for national college competition. May be repeated to a maximum of four credit hours. Prereq: PLS 396 and qualifying for national competition.

PLS 408 TOBACCO.

(3)

History, botany, pathology, entomology, breeding, and culture of tobacco with special emphasis on burley. Prereq: PLS 386 or consent of instructor.

PLS 440 PLANT PROPAGATION.

(3)

A study of the principles and practices involved in producing plants by sexual and asexual methods and to provide the basic skills necessary for using these methods. The interrelationship of plant growth, structure and the environment as they affect the ability to propagate plants by a specific method. Lecture, two hours; laboratory, three hours per week. Prereq: PLS 210.

PLS 450G BIOGEOCHEMISTRY.

(3)

A lecture and lab course emphasizing the role of microbial processes on elemental and pollutant cycling in terrestrial soils and aquatic sediments. Soils and sediments from different ecosystems are evaluated for microbial community composition and biogeochemical cycling of organic and inorganic nutrients and pollutants using advanced molecular and laboratory techniques. Several all day field trips and laboratory exercises required. Limited to eight students at the senior or higher level standing. Prereq: CHE 105, 107, 111, 113. (Same as NRE 450G.)

PLS 451 LANDSCAPE MANAGEMENT AND ARBORICULTURE.

(3)

Discussion of the protection, pruning, repair, and culture of plant material in landscape plantings as well as the diagnosis of plant-related problems and the management principles of landscape maintenance. Lecture, two hours; laboratory, three hours per week. Prereq: PLS 210, PLS 386.

PLS 455G WETLAND DELINEATION.

(3)

Basic concepts of natural wetland ecosystems, their importance, functions, and major features used for their identification and classification. Application of basic hydrology, hydrophytic vegetation and hydric soil indicators for identification of jurisdictional wetlands utilizing documentation and analysis of field collected data. Three laboratory exercises and four short field trips required. Prereq: PLS 366 or consent of instructor. (Same as NRE 455G.)

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- PLS 465 GREENHOUSES AND CONTROLLED ENVIRONMENTS. (3)**
A study of greenhouse structures, coverings, equipment, and the monitoring and regulation of the environment including temperature, light, carbon dioxide, and relative humidity as these factors relate to the commercial production of greenhouse crops. Other types of controlled environments are also included. Lecture, two hours; laboratory, two hours per week. Prereq: PLS 386.
- PLS 468G SOIL USE AND MANAGEMENT. (3)**
The application of principles related to soils and their management in planning the utilization of land and associated resources. Lecture and discussion. Prereq: PLS 366 or consent of instructor.
- PLS 470G SOIL NUTRIENT MANAGEMENT. (3)**
Soil reaction/cycling of elements essential for plant growth; rates, timing and placement of nutrient sources in modern crop/soil management systems; plant and soil sampling and analysis to diagnose plant nutrient stress. Prereq: CHE 105, PLS 366 and PLS 386 or consent of instructor. (Same as NRE 470G.)
- PLS 490 TOPICS IN PLANT AND SOIL SCIENCE. (3)**
A capstone course for majors in Plant and Soil Science to be taken near the conclusion of the student's academic career. The course provides the student the opportunity to integrate knowledge acquired in previous courses in the plant and soil science and support areas. Emphasis will be placed on problem solving, synthesizing and integrating information, critical thinking, group activities, and written and oral communication. Instructional methods may include formal lectures, laboratories or supervised individual research. The specific nature of the course depends upon the student's Area of Emphasis within the Plant and Soil Science major. All topics offered will be approved by the Undergraduate Education Committee in the Area of Emphasis. Prereq: Senior in Plant and Soil Science. This course is a Graduation Composition and Communication Requirement (GCCR) course in certain programs, and hence is not likely to be eligible for automatic transfer credit to UK.
- PLS 502 ECOLOGY OF ECONOMIC PLANTS. (3)**
Study of the physical environment (radiation, temperature, precipitation, and evapotranspiration) in which crops are grown and the effect of the environment on crop growth and yield. Both micro- and macro-climatic relationships are considered.
- PLS 510 FORAGE MANAGEMENT AND UTILIZATION. (3)**
Critical study of grassland plants and the biological and physical factors operative in utilization of natural and cultivated grasslands by domestic animals. Lecture, three hours. Prereq: PLS 386, or consent of instructor.
- PLS 512 GRAINS AND OILSEEDS. (3)**
Management and production of major grains and oilseeds in Kentucky. Prereq: PLS 366, PLS 386, or similar courses; senior or graduate student.
- PLS 514 GRASS TAXONOMY AND IDENTIFICATION. (3)**
Overview of the grass family, concentrating on taxonomic issues and identification skills for ~200 species (turf, forages, weeds, etc.). Lecture: two hours; laboratory: two hours per week. Prereq: PLS 220 or permission from instructor.
- PLS 515 TURF MANAGEMENT. (3)**
A study of the selection, culture, and management of certain turf species used for home lawns, golf courses, athletic fields, and highway slopes. Lecture, two hours; laboratory, two hours. Prereq: PLS 210 and PLS 366.
- PLS 520 FRUIT AND VEGETABLE PRODUCTION. (4)**
Commercial production practices for major fruits and vegetables. Prereq: PLS 386.
- PLS 525 NURSERY AND FLORICULTURE CROP PRODUCTION. (4)**
This course presents advanced methods and concepts for the commercial production of selected nursery and floriculture crops under field, greenhouse and controlled environments. Field trips for this course may end up to one hour later than the scheduled time due to distances traveled to commercial greenhouse and nursery firms. Prereq: PLS 386 and PLS 440.

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PLS 531 FIELD SCHOOLS IN CROP PEST MANAGEMENT. (2)

A course for the Plant Pest Management option in Plant and Soil science to reinforce the concepts of pest management learned in previous courses. Emphasis will be placed on integrating information to develop pest management strategies. Instructional methods will include formal lectures and laboratories in the field. Prereq: ENT 300 or ENT 310 or ENT 320; PLS 404 and PPA 400G; or consent of instructor.

PLS 556 SEED PRODUCTION AND TECHNOLOGY. (3)

A study of seeds of improved cultivars as a delivery system for plant genetics. Principles of seed production, harvesting and conditioning for agronomic and horticultural crops within and outside of the region of adaptation. Seed multiplication systems, seed testing and the laws and regulations related to marketing high quality seed. Lecture, two hours; laboratory, four hours for 12 weeks. Prereq: PLS 386 or consent of instructor.

PLS 557 SEED VIGOR. (2)

Study of the concept of seed vigor, methods for seed vigor testing, and the relationship of seed vigor to seedling emergence and crop performance. Prereq: An introductory crop production or basic botany course.

PLS 560 ECOTOXICOLOGY. (4)

Emphasis will be placed on the physiological and toxicological effects of chemicals on natural biota, including considerations at cellular, organismal, population, and community levels. This will include assimilation and metabolism of pollutants by animal species, with emphasis upon biochemical and physiological mechanisms involved in stress-induced responses and stress reduction. Additional areas of concern will include the transport, fate, and effects of chemical stressors on structure and function of biotic communities and will include introductions to ecotoxicology and environmental regulatory strategies. Prereq: CHE 105, CHE 107, BIO 150, BIO 153 and BIO 315 or BIO 350 or PGY 502 or equivalent or consent of instructor. (Same as TOX 560.)

PLS 566 SOIL MICROBIOLOGY. (3)

The nature and biochemical activities of soil microflora; their significance in soil genesis and structure and their role in soil fertility. Prereq: PLS 366 or an introductory microbiology course or consent of instructor.

PLS 567 METHODS IN SOIL MICROBIOLOGY. (1)

Methods in Soil Microbiology will be a laboratory course dedicated to introducing upper division students to the methods and techniques used by microbiologists and other soil scientists to examine organisms, interactions, and processes in soil systems. Laboratory, three hours per week. Prereq: PLS 366 or introductory microbiology course.

PLS 573 SOIL MORPHOLOGY AND CLASSIFICATION. (3)

Study of concepts of soil horizons, soil profiles and soilscapes; morphological, physical, chemical and mineralogical parameters useful in their characterization. Soil forming factors and processes. Basic principles of soil classification. Characterization of selected Kentucky soils and their placement in the modern system; practical field problems in soil identification, characterization and classification. Lecture, two hours; laboratory, three hours per week. Prereq: PLS 366 and PLS 367 or consent of instructor.

PLS 575 SOIL PHYSICS. (3)

This course deals with the state and movement of matter, and with the fluxes and transformations of energy, in soil systems. Its objectives are to develop a basic theoretical understanding of soil physical properties and processes (with emphasis on the statics and dynamics of soil water), and to demonstrate how this understanding can be applied under field conditions to make sound management decisions concerning both agricultural and non-agricultural uses of soils. Prereq: MA 113 or MA 123, PHY 201 or PHY 211, PLS 366 or consent of instructor.

PLS 576 LABORATORY IN SOIL PHYSICS. (1)

This course consists of laboratory and field exercises designed to increase understanding of important soil physical properties and processes. Its objectives are to develop familiarity with standard methods of measuring soil physical parameters, and to instill scientific methods of data collection, analysis and interpretation. Prereq: PLS 367, concurrent enrollment in PLS 575, or consent of instructor.

PLS 581 CHEMICAL ANALYSIS OF SOILS AND PLANTS. (4)

Laboratory emphasis on instrumental methods and techniques used in quantitative and qualitative chemical analysis of soil and plant materials and relation of these analyses to physical, chemical and biological systems. Lecture, one hour; discussion, one hour; laboratory, four hours. Prereq: PLS 366 or equivalent, or consent of instructor.

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PLS 597 SPECIAL TOPICS IN PLANT AND SOIL SCIENCE (Subtitle required). (1-3)

Special topical or experimental courses in crop science, soil science or related areas of horticulture, or plant physiology for graduate and advanced undergraduate students. Special subtitle required and must be approved by the chair of Agronomy or Horticulture. A particular subtitle may be offered twice under PLS 597. Students may not repeat under the same subtitle. Prereq: Permission of instructor.

PLS 599 SPECIAL PROBLEMS IN PLANT AND SOIL SCIENCE. (1-4)

May be repeated for a maximum of nine credits. Prereq: Consent of instructor.

PLS 601 SPECIAL TOPICS IN MOLECULAR AND CELLULAR GENETICS. (1)

Each semester five distinguished scientists visit the UK campus to deliver a series of three formal lectures each and participate in numerous informal contacts with graduate students. The emphasis is on the presentation of the most current advances (often unpublished) in selected topics in molecular and cellular genetics. May be repeated to a maximum of six credits. (Same as BCH/BIO/MI/PPA 601.)

PLS 602 PRINCIPLES OF YIELD PHYSIOLOGY. (3)

Critical study of the physiological factors and processes involved in determining economic yield in grain crops. The focus will be on factors operating at the whole plant and plant community level as opposed to physiological processes at the cellular or subcellular level. A logical, analytical description of the process of economic yield production by grain crops will be developed and related to historical changes in crop yields and the potential for increasing yields in the future. Prereq: PLS 386 and BIO 430G or consent of instructor.

PLS 609 PLANT BIOCHEMISTRY. (3)

The course will consider the chemical constituents of plants (with emphasis on biologically or nutritionally significant compounds unique to plants), their biosynthesis, contribution to key metabolic and defense processes and the regulation of their synthesis. Included will be discussions of photosynthesis, carbohydrates, lipids, isoprenoids and phenylpropanoids, nitrogen fixation, nitrogen and sulfur reduction and assimilation, alkaloids and additional secondary compounds, frontiers in plant biochemistry. Prereq: BCH 607 or equivalent or consent of instructor. (Same as BCH/PPA 609.)

PLS 615 ADVANCED PLANT GENETICS AND GENOMICS. (3)

Genomics is reshaping the life sciences, providing high-throughput tools to decipher function of individual genes and to characterize their regulation and interactions. This course will introduce graduate students to most recent advances in the area of plant genetics and genomics. The topics will include structural and functional analysis of plant genomes, genome evolution, application of genomics tools to crop improvement, and basic concepts of bioinformatics. Prereq: Introductory courses in genetics and biochemistry.

PLS 620 PLANT MOLECULAR BIOLOGY. (3)

This course is intended to be a treatment of current concepts of plant molecular biology. It will be a literature-based course, supplemented by handouts and reading lists. The course will deal as much as is possible with topics that are unique to plants. Current aspects of molecular biology that are relevant to the course content will be covered in the first part of the course; however, these lectures will not be a review of topics that should have been retained from introductory genetics and biochemistry courses. Also, they will not be a substitute for a molecular biology course. Prereq: One semester of undergraduate genetics and biochemistry or consent of instructor. (Same as BIO 620.)

PLS 622 PHYSIOLOGY OF PLANTS I. (3)

A physiological/biochemical treatment of central topics in modern plant physiology. Topics will include: plant-cell biology, ion transport, water and translocation, respiration and photosynthesis. Prereq: BIO 430G or equivalent or consent of coordinator. Prereq or concur: BCH 607. (Same as BIO/FOR 622.)

PLS 623 PHYSIOLOGY OF PLANTS II. (3)

A physiological/biochemical treatment of central topics in modern plant physiology. Topics will include: plant hormones, an introduction to plant biotechnology, senescence and abscission, stress physiology, phytochrome-photomorphogenesis-phototropism nitrogen and sulfur metabolism. Prereq: BIO 430G or equivalent or consent of coordinator. Prereq or concur: BCH 607. (Same as BIO/FOR 623.)

PLS 640 IDENTIFICATION OF PLANT DISEASES. (3)

Recognition and identification of plant diseases and their causes and development. The course is designed to give students practical experience in dealing with a wide array of plant diseases, symptom expressions, causal agents and interactions with environmental factors encountered in the difficult task of identifying plant diseases. May be repeated to a maximum of nine credits. Lecture, one hour; laboratory, six hours. Prereq: PPA 400G or equivalent or consent of instructor. (Same as PPA 640.)

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- PLS 642 BIOSYNTHESIS OF NATURAL PRODUCTS. (3)**
An overview of the biochemical pathways leading to compounds called natural products/secondary metabolites. Prereq: Two semesters of organic chemistry. (Same as BCH/PHR 620.)
- PLS 650 SOIL-PLANT RELATIONSHIPS. (3)**
An advanced course on the relationships between media and the root systems of plants growing therein. Prereq: PLS 366, BIO 430G (or equivalent), or consent of instructor.
- PLS 655 SPATIAL AND TEMPORAL STATISTICS. (3)**
Opportunities for spatial and temporal monitoring strategies, the diagnosis and analysis of spatial and temporal agricultural and ecosystem processes are taught. Methodology is based on Statistical Time Series Analysis and Geostatistics. Prereq: STA 570 or other prerequisite in agreement with the instructor.
- PLS 657 SEED BIOLOGY. (3)**
Structure, development and function during plant reproductive development and seed ontogeny, including fertilization, embryogeny and endosperm development, seed formation, maturation, germination, dormancy and deterioration. Prereq: ABT 360, BIO 430G or consent of instructor.
- PLS 660 ADVANCED SOIL BIOLOGY. (2)**
A critical evaluation of the current research status in selected aspects of soil biology. Prereq: PLS 566 or consent of instructor.
- PLS 664 PLANT BREEDING I. (3)**
The application of advanced genetic principles to plant improvement. An in-depth study of existing plant breeding procedures and their applications and consideration of new techniques that can be applied to plant breeding and crop improvement. Prereq: STA 570 or consent of instructor.
- PLS 671 SOIL CHEMISTRY. (4)**
A study of the chemical characteristics of the soil and of the more important chemical processes in the soil. Lecture and discussion, three hours; laboratory, two hours. Prereq: PLS 470G, 581; CHE 442G, or consent of instructor.
- PLS 676 QUANTITATIVE INHERITANCE IN PLANT POPULATIONS. (3)**
After a brief review of population genetics theory, the course is divided into two sections which cover methods of estimating genetic variances and selection methods in population improvement. The course will focus on handling and interpretation of actual data sets through data analysis and discussion of current literature. Prereq: STA 570, STA 671, and STA 672. (Same as STA 676.)
- PLS 697 SPECIAL TOPICS IN PLANT AND SOIL SCIENCE (Subtitle required). (1-3)**
Special topic or experimental course in cross science, horticulture, plant physiology or soil science for advanced graduate students. Special title required and must be approved by the chairpersons of the Departments of Agronomy and Horticulture. A particular title may be offered twice, at most, under PLS 697. Students may not repeat under the same title. May be repeated to a maximum of six hours. Prereq: Consent of appropriate instructor before registering.
- PLS 712 ADVANCED SOIL FERTILITY. (4)**
An integration of the effects of soil, climate, species and management on the nutrition and dry matter accumulation of plants. Lecture, three hours; laboratory, two hours per week. Prereq: PLS 470G or PLS 650 or consent of instructor.
- PLS 741 ENVIRONMENTAL CLAY MINERALOGY. (3)**
A comprehensive study of the crystal structures of clay minerals commonly found in soils and sediments. Lecture and discussion, two hours; laboratory, three hours. Prereq: GLY 360 or consent of instructor. (Same as EES 741.)
- PLS 748 MASTER'S THESIS RESEARCH. (0)**
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

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- PLS 749 DISSERTATION RESEARCH.** (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of qualifying exams.
- PLS 767 DISSERTATION RESIDENCY CREDIT.** (2)
Residency credit for dissertation research after the qualifying examination. Students may register for this course in the semester of the qualifying examination. A minimum of two semesters are required as well as continuous enrollment (Fall and Spring) until the dissertation is completed and defended.
- PLS 768 RESIDENCE CREDIT FOR MASTER'S DEGREE.** (1-6)
May be repeated to a maximum of 12 hours.
- PLS 769 RESIDENCE CREDIT FOR THE DOCTOR'S DEGREE.** (0-12)
May be repeated indefinitely.
- PLS 772 SEMINAR IN PLANT AND SOIL SCIENCE (Subtitle required).** (1)
Reports and discussion of problems and research in crops, soils, horticultural science and plant physiology. May be repeated three times for a maximum of four credits.
- PLS 799 RESEARCH IN PLANT AND SOIL SCIENCE.** (1-4)
May be repeated for a maximum of 12 credits. Prereq: Consent of instructor.