

Plant, Insect & Microbial Sciences Graduate Programs

Contact Information

Division of Plant Sciences

1-31 Agriculture Building

573-884-5776

573-882-2699

[http://plantsci.missouri.edu/
about/](http://plantsci.missouri.edu/about/)

About Plant, Insect & Microbial Sciences Graduate Programs

The Division of Plant Sciences maintains excellent graduate programs with classroom instruction and research supervision provided by leading scientists in the field. The DPS offers graduate programs leading to the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in Plant, Insect and Microbial Sciences. A student can select training from a wide range of courses and research programs to prepare for a career in research, teaching, industry and extension work. Students can follow a traditional curriculum or take advantage of the cross-disciplinary expertise that exists within the division.

The division is part of the College of Agriculture, Food and Natural Resources at the University

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of Missouri-Columbia, known as MU. MU is one of only 32 elite public universities to be selected for membership in the American Association of Universities (AAU). AAU members are the nation's most prestigious research institutions. As a member of the AAU and a "Research I" university classified by the Carnegie Foundation for the Advancement of Teaching, MU is a premiere provider of graduate education.

Programmatic Interactions

Students also benefit from interaction with closely allied academic units on and off campus. Students work with scientists in two campus-based USDA research units associated with the division: the Plant Genetics Unit and the Biological Control of Insects Research Laboratory. Additional opportunities exist for interaction with scientists at the Donald Danforth Plant Science Center in St. Louis. Numerous USDA and Danforth Center scientists hold adjunct appointments in the DPS. Students in the DPS are encouraged to interact with interdisciplinary programs on campus such as the Interdisciplinary Plant Group, the Molecular Biology Program, the Genetics Area Program, the Center for Agroforestry and the Missouri Precision Agriculture Center.

Degrees

The Division of Plant Sciences offers graduate programs in Plant, Insect & Microbial Sciences leading to the Master of Science (MS) and Doctor of Philosophy (PhD) degrees.

Areas of Study

A student can select training from a wide range of courses and research programs to prepare for a career in research, teaching, industry and extension work. Students may complete their graduate degrees through any of the Graduate Program areas:

- * Crop, Soil & Pest Management
- * Entomology
- * Horticulture
- * Plant Biology & Genetics
- * Plant Microbiology & Pathology

Plant, Insect & Microbial Sciences Faculty

Wayne C. Bailey

associate professor, PhD, Iowa State University. Forage and field entomology.

Bruce A. Barrett

associate professor, PhD, Washington State University. Insect behavior, tree fruit entomology.

Dale G. Blevins

professor, PhD, University of Kentucky. Plant physiology.

Kevin Bradley

assistant professor, PhD, Virginia Tech. Weed science.

Johann N. Bruhn

research associate professor, PhD, University of California-Berkeley. Forest mycology and mushroom cultivation.

Arun K. Chatterjee

professor, PhD, University of Guelph. Molecular genetics of plant bacteria.

Michael Collins

director, Plant Sciences, PhD, University of Kentucky, Crop Science, Forage Management and Utilization.

Georgia L. Davis

associate professor, PhD, University of Wisconsin. Corn genetics.

James T. English

interim associate director, Division of Plant Sciences, professor, PhD, University of Florida. Molecular ecology of plant microbe interactions.

Deborah L. Finke

assistant professor, PhD, University of Maryland. Entomology/Plant-insect interactions.

Felix B. Fritschi

assistant professor, PhD, University of California-Davis. Crop physiology.

Walter Gassmann

associate professor, PhD, University of California-San Diego. Molecular plant pathogen interactions.

Mary Ann Gowdy

resident teaching assistant professor, PhD, Oklahoma State University. Floriculture.

Robert D. Hall

professor, associate vice chancellor for research, PhD, Virginia Polytechnic Institute. Medicinal, veterinary and forensic entomology.

Richard M. Houseman

associate professor, PhD, Texas A&M University. Insect ecology and behavior in human environments.

Robert L. Kallenbach

associate professor, PhD, Texas Tech University. Forage management.

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Marc J. Linit

associate dean, College of Agriculture, Food & Natural Resources, professor, PhD, University of Arkansas. Ecology of forest insects.

John A. Lory

extension associate professor, PhD, University of Minnesota. Environmental nutrient management.

Anne L. McKendry

associate professor, PhD, University of Manitoba, Canada. Wheat breeding.

Jeanne D. Mihail

director of graduate studies, professor, PhD, University of Arizona. Fungal ecology and mushroom cultivation.

Melissa G. Mitchum

assistant professor, PhD, North Carolina State University. Molecular plant nematode interactions.

Manjula V. Nathan

extension associate professor, director, Soil Testing and Plant Diagnostic Services Laboratories, PhD, South Dakota State University.

Kelly A. Nelson

research associate professor, PhD, Michigan State University. Crop production systems.

Henry T. Nguyen

endowed professor, PhD, University of Missouri. Genetics and biotechnology.

Harlan L. Palm

research assistant professor, PhD, University of Missouri-Columbia. Precision agriculture.

Craig A. Roberts

professor, PhD, University of Arkansas. Forage quality.

Peter C. Scharf

associate professor, PhD, Virginia Tech. Nutrient management.

James E. Schoelz

professor, PhD, University of Kentucky. Molecular plant virus interactions.

J. Grover Shannon

endowed professor, PhD, Purdue University. Soybean breeding.

Robert E. Sharp

professor, PhD, University of Lancaster, England. Plant physiology.

Robert W. Sites

professor, PhD, Washington State University. Insect systematics, ecology of aquatic insects.

David A. Sleper

professor, PhD, University of Wisconsin. Soybean breeding.

Reid J. Smeda

director of undergraduate programs, associate professor, PhD, Purdue University. Weed science.

Qisheng Song

associate professor, PhD, University of Maryland. Insect physiology and molecular biology.

Gary Stacey

endowed professor, PhD, University of Texas-Austin. Functional genomics of soybean microbe interactions.

Christopher J. Starbuck

associate professor, PhD, Oregon State University-Corvallis. Woody ornamentals.

Richard K. Striegler

research associate professor, PhD, Michigan State University. Viticulture and enology.

W. Gene Stevens

extension associate professor, PhD, Mississippi State University. Crop production-soil fertility.

Laura Sweets

extension associate professor, PhD, University of Minnesota. Agricultural extension plant pathology.

Kelly V. Tindall

research assistant professor, agricultural entomology, PhD, Louisiana State University.

David H. Trinklein

associate professor, PhD, University of Missouri. Greenhouse management, floriculture extension.

Leszek Vincent

Research assistant professor, PhD, University of Natal, South Africa. Plant systematics and medicinal plants.

Michele R. Warmund

professor, PhD, University of Missouri. Fruit and nut crop physiology.

William J. Wiebold

extension program leader, professor, PhD, University of Georgia. Soybean and corn management.

J. Allen Wrather

professor, PhD, University of Missouri. Soybean disease control.

Zhanyuan Zhang

research associate professor, PhD, University of Nebraska. Plant transformation and gene regulation.

Adjunct Faculty**Stephen H. Anderson**

adjunct professor, PhD, North Carolina State University. Soil physics.

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Prakash R. Arelli

adjunct professor, PhD, University of Georgia. Soybean breeding and genetics.

Brenda T. Beerntsen

adjunct associate professor, PhD, University of Wisconsin-Madison. Entomology, medicinal-veterinary vectors.

Paul R. Beuselinck

adjunct professor, PhD, Oregon State University. Soybean seed physiology.

Kristin D. Bilyeu

adjunct assistant professor, PhD, Baylor College of Medicine. Soybean seed molecular genetics.

Ed Cahoon

adjunct associate professor, PhD, Michigan State University. Soybean molecular biology.

Thomas A. Coudron

adjunct associate professor, PhD, North Dakota State University. Insect biochemistry and biological control.

Claude Fauquet

adjunct professor, PhD, Strasburg. Plant virology, tropical plant biotechnology.

J. Perry Gustafson

adjunct professor, PhD, University of California-Davis. Cereal genetics.

Eliot Herman

adjunct professor, PhD, University of California-San Diego. Soybean molecular biology.

Bruce E. Hibbard

adjunct associate professor, PhD, Colorado State University. Insect resistance management.

Newell R. Kitchen

adjunct associate professor, PhD, Colorado State University. Soil nutrient management, precision agriculture.

Laszlo Kovacs

adjunct associate professor, PhD, University of Missouri. Vitis genomics and gene discovery.

Robert J. Kremer

adjunct professor, PhD, Mississippi State University. Soil microbiology.

Hari B. Krishnan

adjunct professor, PhD, Washington State University. Soybean molecular biology.

Robert K. Lawrence

adjunct assistant professor, PhD, Michigan State University. Forest entomology.

Arthur H. McIntosh

adjunct professor, ScD, Harvard University. Biological control, insect pathology.

Michael D. McMullen

adjunct professor, PhD, University of Chicago. Corn genetics.

Peter P. Motavalli

adjunct associate professor, PhD, Cornell University. Soil nutrient management.

Robert L. Myers

adjunct associate professor, PhD, University of Minnesota. Sustainable agriculture.

Mel Oliver

research leader, adjunct professor, PhD, University of Calgary. Plant biochemistry.

Holly J. Popham

adjunct assistant professor, PhD, University of Missouri. Insect virology and immunity.

Wenping Qiu

adjunct associate professor, PhD, North Carolina State University. Vitis genomics and gene discovery.

Daniel Schachtman

adjunct associate professor, PhD, Australian National University. Plant physiology and molecular biology.

Mary A. Schaeffer

adjunct associate professor, PhD, Duke University. Bioinformatics.

Kent S. Shelby

adjunct assistant professor, PhD, Oklahoma State University. Insect physiology and immunobiology.

David Stanley

research leader, adjunct professor, PhD, University of California - Berkeley. Entomology.

Chris Taylor

adjunct assistant professor, PhD, North Carolina State. Nematology and rhizosphere biology.

Paul Tracy

adjunct associate professor, PhD, Colorado State. Soil fertility.

Oliver Yu

adjunct assistant professor, PhD, University of South Carolina. Soybean molecular biology.

Emeritus Faculty**Sam C. Anand**

professor emeritus, PhD, University of Wisconsin. Soybean breeding and genetics.

G. Michael Chippendale

professor emeritus, PhD, University of Wisconsin. Insect physiology.

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Edward H. Coe

professor emeritus, PhD, University of Illinois. Corn genetics.

John H. Dunn

professor emeritus, PhD, Rutgers University. Turfgrass management.

Curtis J. Nelson

Curator's professor emeritus, PhD, University of Wisconsin. Crop physiology.

Thomas D. Wyllie

professor emeritus, PhD, University of Minnesota. Plant pathology.

About Plant, Insect & Microbial Sciences Graduate Application and Admission

Admission

Contact Information
Ms. Rumi Westergren
1-40A Agriculture Building
Columbia, MO 65211
573-884-5776

Admission Criteria

Fall deadline: flexible: January 15 for greatest financial aid considerations

- Minimum TOEFL score: 500/173 (paper/computer)
- Minimum GRE score: none set
- Minimum GPA: 3.0
- Bachelor's degree from an accredited college
- Demonstrated capability to perform graduate-level work

[Required Application Materials to the Graduate School:](#)

All required Graduate School documents.

[Required Application Materials to the Plant, Insect & Microbial Sciences Program:](#)

- 3 letters of recommendation
- GRE score report
- 1-2 page letter clearly articulating educational and professional goals
- Brief (2 pages) resume

Financial Aid from the Program

Financial assistance is available to qualified students at both the MS and PhD levels, as either fellowships or research assistantships. Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

Graduate Program Area Requirements

Detailed descriptions of divisional curricula and procedures are available in the Graduate Student Handbook available on the Division Web site.

Crop, Soil & Pest Management

To meet the divisional requirements, each student will work with their adviser and graduate committee to develop a customized course of study best suited to the student's educational and career goals.

Entomology

In partial fulfillment of divisional requirements, graduate students will complete the following entomology courses:

- PLNTS 7710 Systematic Entomology

- PLNTS 7820 Principles of Insect Physiology
- PLNTS 9810 Insect Ecology

Horticulture

In partial fulfillment of divisional requirements, master's students will take 15 hours of the required 30 hours in courses numbered 8000 or above. At least 6 of the 15 hours must be from formal courses, excluding Problems and other independent study courses. All programs of study must include at least 6 hours of research (Plant Science 8090) and, while additional hours of research may be taken, only 6 hours may be counted toward the 30-hour degree requirement.

All doctoral students will have successfully completed the requirements for a master's degree before beginning a doctoral program. The student will work with their adviser and graduate committee to develop a customized course of study in partial fulfillment of divisional requirements. No more than 30 hours of research (24 hours from the PhD and 6 hours from the MS degrees) may be counted toward the 72 hour minimum requirement. No more than 6 hours may be transferred from other institutions.

Plant Biology & Genetics

To meet the divisional requirements, each student will work with their adviser and graduate committee to develop a customized course of study best suited to the student's educational and career goals.

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Plant Microbiology & Pathology

In partial fulfillment of divisional requirements, all graduate students will complete a core group of classes:

- * BIOCH 7270 Biochemistry
- * PLNTS 7500 Theory and Concepts of Plant Pathology
- * PLNTS 7510 Introductory Plant Pathology Laboratory
- * PLNTS 9540 Genetics of Plant-Microorganism Interaction

Masters' students will select one elective class and doctoral students will select two elective classes focused on specific microbial groups: All graduate students will enroll in Readings in Plant Pathology (PLNTS 7965) one semester per academic year.

Satisfactory Rate of Progress

A student shall maintain a minimum grade point average of 3.0. All divisional course requirements (and any additional requirements set by the student's examination committee) shall be completed in a timely manner. All advisers will meet annually with each of their graduate advisees. They will discuss the student's performance, any problems that exist and any suggestions for improvement. The adviser will provide the student and the director of graduate studies with a written summary of the meeting as part of the annual program assessment process.

Division wide Requirements

All MS and PhD students will be required to take a graduate-level research ethics class (e.g. PS 8010).

Masters' students must enroll in Plant Sciences Seminar for at least

three semesters. Students enroll in Plant Sciences 9087 for an A/F grade and make a presentation during at least one semester. For at least two semesters when the student does not make a presentation, he/she will enroll in Plant Sciences 7087 for an S/U grade. The thesis defense seminar cannot be given in fulfillment of the PS 9087 requirement.

Doctoral students must enroll in Plant Sciences Seminar for at least five semesters. Students enroll in Plant Sciences 9087 for an A/F grade and make a presentation during at least two semesters. For at least three semesters when the student does not make a presentation, he/she will enroll in Plant Sciences 7087 for an S/U grade. Doctoral students on 'continuous enrollment' who have not fulfilled all seminar requirements must contact the Graduate School to indicate that they will be enrolling for 1 credit of seminar and 1 credit of dissertation research (Plant Science 9090). The dissertation defense seminar cannot be given in fulfillment of the PS 9087 requirement.

Plant, Insect & Microbial Sciences Courses

PLNT S 7001

Topics (1-4).

Initial offering of a course(s) in a specific subject matter area. Offered when proposed by a faculty member in that area of expertise. Prerequisite: graduate standing.

PLNT S 7085

Problems (1-3).

Advanced studies not expected to terminate in thesis. Problems

arranged with individual faculty member in specific matter area. Prerequisite: instructor's consent.

PLNT S 7087

Seminar (1).

In-depth development of advanced aspects of plant, insect, or microbial sciences through reviews of results of research in progress and current scientific publications. Graded on S/U basis only.

PLNT S 7090

Nonthesis Research (1-9).

Original investigation not leading to preparation of thesis.

PLNT S 7313

Soil Fertility and Plant Nutrition (3). (same as Soil Science 7313). Explanation of principles of delivery of plant nutrients to plants, discussion of the role of each essential nutrient in crop plants and introduction to the management of soil amendments. Prerequisites: Graduate standing and SOIL 2110 or instructor's consent.

PLNT S 7314

Soil Fertility and Plant Nutrition Laboratory (2).

(same as Soil Science 7314). The application of elementary analytical procedures to the evaluation of the nutrient status of soils and crop plants. Prerequisite: graduate standing concurrent enrollment or previous completion of SOIL 4313/7313.

PLNT S 7315

Crop Physiology (3).

Basic course on crop growth and development. Emphasis is

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on physiological processes and morphology of crop plants, and their application to crop breeding and management decisions. Prerequisites: graduate standing and PLNT S 2110 or equivalent.

PLNT S 7320

Plant Physiology (3-5).

(Same as Biological Sciences 7320.) Modern physiology of higher plants using common cultivated plants as examples. May be taken with or without laboratory. Prerequisite: graduate standing and BIO SC 1500 or 1200 and five hours of chemistry.

PLNT S 7325

Field Crop Breeding (3).

Plant Science 4325 will introduce students to the application of genetics and the plant sciences to the breeding and improvement of self-pollinated field crops. Classical, current and innovative plant breeding techniques will be addressed. Prerequisite: graduate standing and PLNT S 2110 and 3225.

PLNT S 7330

Plant Breeding Theory (3).

Designed to provide a logical application of genetic concepts to mating and selection theory in general improvement of cross pollinated crops. Prerequisite: graduate standing and PLNT S 3225 or equivalent.

PLNT S 7350

Readings (1-3).

Individual study of assigned topics. Prerequisite: instructor's consent.

PLNT S 7355

Advanced Turfgrass Management (3).

Provides turfgrass majors a more informative and applicable look at mathematics of turfgrass management, application techniques, cultural practices, and soil/water relationships applicable to careers in golf course and sports turf management, lawn care, and professional grounds maintenance. Prerequisites: PLNT S 3355 or instructor's consent. Graded on A/F basis only.

PLNT S 7360

Precision Agriculture Science and Technology (3).

(same as Agricultural Systems Management 7360 and Soil Science 7360). Precision agriculture is an information-based approach to farming whereby variability is managed to optimize crop production and reduce environmental pollution. This course provides an overview of precision agriculture technologies (like GIS, GPS, remote sensing), mapping methods, and case studies illustrating decisions and management. Prerequisites: graduate standing and SOIL 2100, PLNT S 2110 or instructor's consent.

PLNT S 7365

Greenhouse Crops Production (4).

Production management decision and commercial culture of the major floriculture crops. Prerequisite: graduate standing and PLNT S 3260 or instructor's consent.

PLNT S 7370

Small Fruit and Vegetable Production (3).

Emphasizes production, management and marketing practices for small fruit and vegetable crops. Prerequisites: graduate standing and PLNT S 2100, 3230, and 3235.

PLNT S 7500

Theory and Concepts of Plant Pathology (3).

To provide information on disease development in plant populations; possible control strategies combined with training in retrieving and critically reviewing research information. Prerequisites: 5 hours Biological Sciences, graduate standing.

PLNT S 7510

Introductory Plant Pathology Laboratory (2).

Complements Plant Science 7500 through laboratory study of pathogens, disease and life cycles, diagnosis, and method of disease control for agronomic, ornamental and woody plants. Prerequisites: PLNT S 7500 or concurrently.

PLNT S 7710

Systematic Entomology (5).

Taxonomy of insects: emphasizes biology and classification of orders and major families. Insect collection required. Prerequisites: graduate standing and ENTOM 3710 and 3715 or 10 hours Biological Sciences.

PLNT S 7720

Aquatic Entomology (3).

Identification, life histories, ecology

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of aquatic arthropods; emphasizes fresh-water insects. For students of wildlife, fisheries management, aquatic biology, advanced entomology. Prerequisites: graduate standing and ENTOM 3710 and 3715 and BIO SC 1100 and PLNT S 7710 or equivalent.

PLNT S 7730

Insect Pest Management for Plant Protection (3).

Identification and importance of insect pests of crops, detection techniques, economic injury levels, and recent development in control techniques of importance to insect management decisions. Prerequisites: graduate standing and ENTOM 3710 and 3715.

PLNT S 7820

Principles of Insect Physiology (4). Major concepts of insect physiology emphasizing functions of organ-systems sensory physiology hormones in development, nutrition. Prerequisites: graduate standing ENTOM 3710 and 3715 and PLNT S 7810 or equivalent.

PLNT S 7965

Readings in Plant Pathology (1-9). Independent readings and discussion of recent research publications. Topics selected in consultation with supervisory faculty member. Prerequisite: instructor's consent.

PLNT S 7970

Readings in Molecular Ecology of Herbivory (1).

The application of molecular biology tools to the rich history of chemical, physiological, population, and multi-trophic ecology studies on plant herbivore inter-

actions has made for an exciting, fast-paced field at the forefront of ecology, 'functional biology' and 'systems biology'. Prerequisites: instructor's consent; graduate standing.

PLNT S 7975

Advanced Landscape Design (4). Development of project presentation techniques by analysis of the social, cultural, historical and ecological aspects of landscape design. Prerequisites: graduate standing and PLNT S 2254, instructor's consent.

PLNT S 8001

Topics (1-4). Instruction in specific subject matter areas in plant, insect or microbial sciences. Prerequisite: graduate standing and instructor's consent.

PLNT S 8010

Professionalism and Ethics (2). Ethical issues in the conduct of scientific research including data integrity, plagiarism, and intellectual property. Scientific writing, lab management, peer review and other professional skills for the life sciences. Prerequisite: graduate standing. Graded on A/F basis only.

PLNT S 8090

Thesis Research (1-10). Original investigations in plant, insect or microbial science in support of thesis for master's candidates. Graded on S/U basis only.

PLNT S 8410

Advanced Weed Science (3). Discussion of herbicide physiology and fate in the environment,

current development in weed science theory and methodology, and application of analytical procedures in weed research. Prerequisite: PLNT S 3210 and graduate standing.

PLNT S 8510

Plant Fungus Interactions (3). Detailed study of plant fungus interactions. The morphology, biology and ecology of plant pathogenic fungi, arbuscular mycorrhizae, ectomycorrhizae, and fungal endophytes are included.

PLNT S 8520

Nematode-Plant Interactions (3). Detailed study of diseases caused by plant parasitic nematodes. The biology, morphology, and pathology of these pathogens and their interactions with host plants will be integrated into biologically and economically feasible management strategies. Prerequisites: PLNT S 7500 and 7510. Graded on A/F basis only.

PLNT S 8720

Insect Behavior (3). An examination of the breadth of behaviors found in insects, such as orientation mechanisms, communication, dispersal and migration, defensive mechanisms, lost location, feeding strategies, pollination, courtship and reproduction, and social behavior. Prerequisites: ENTOM 3710 and 3715 or 10 hours of Biological Sciences.

PLNT S 9001

Topics (1-4). Instruction in specific subject matter areas in plant, insect or

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microbial sciences. Prerequisites: graduate standing and instructor's consent.

PLNT S 9087

Seminar in Plant Science (1).

In-depth development of advanced aspects of plant, insect and microbial sciences through reviews of results of research in progress and current scientific publications. Graded on A/F or S/U basis dependent on section.

PLNT S 9090

Dissertation Research (1-10).

Original investigations in plant, insect or microbial science in support of dissertation for doctoral candidates. Graded on a S/U basis only.

PLNT S 9310

Ecology of Grazing Lands Systems (3).

Students travel to grazing lands ecosystems to learn: the components and function of grazing lands; research techniques in soil-plant-animal research; forage-livestock ecology; and the role of forages in conservation practices, wildlife habitat, and sustainable agriculture. Prerequisite: instructor's consent.

PLNT S 9415

Advanced Plant Physiology (3).

Advanced course in the physiology of plant growth and development. Discussion of current and classical studies in plant physiology with emphasis on responses to environmental variation. Prerequisite: PLNT S 4315 or 4320 or equivalent.

PLNT S 9420

Transport and Metabolism of Plant Nutrients (3).

Current and classical concepts in (1) transport of nutrients across plant root membranes and translocation of nutrients in the plant, (2) metabolism and function of plant nutrients and (3) stress caused by mineral imbalances and/or pathogens. Prerequisites: PLNT S 4315 or 4320, and 4313, and BIOCHM 4270 or equivalent.

PLNT S 9425

Advanced Plant Breeding (3).

Plant Science 425 will explore theoretical and applied topics in plant breeding through an examination of classical and current literature. The course will integrate conventional breeding concepts and methodology with current biotechnical approaches to plant improvement. Prerequisite: PLNT S 3225, 4325, 4330 and Statistics 4530.

PLNT S 9440

Applied Quantitative and Statistical Genetics (3).

Estimation of genetic effects using means and variances, diallel analysis, environmental stability responses, index selection, and gain from selection. Prerequisite: PLNT S 4330, STAT 4510, 4530, AN SC 9423, or equivalent.

PLNT S 9470

Genome Sciences (3).

This course examines the concepts and techniques used to understand an organism's genome at the structural and functional level. Microbial, mammalian, and plant species are represented. Genomics is a rapidly evolving field and

the aim is to present the most current perspective in understanding structural and functional aspects. Students are expected to apply critical thinking skills in problem solving, literature reviews, and in class discussions. Graded on A/F basis only. Prerequisites: Bio Sci 2200 or Plant Science 3213 or Plant Science 3225.

PLNT S 9540

Genetics of Plant-Microorganism Interaction (3).

Molecular and general genetics of the interactions between plants and pathogenic or symbiotic microorganisms. Prerequisites: PLNT S 7500 and 7510, one course each in Biochemistry and Genetics.

PLNT S 9810

Insect Ecology (3).

Ecological aspects of insect populations and communities including population dynamics, predator-prey interactions, competition, diversity and stability. Quantitative methods are emphasized. Prerequisites: ENTOM 3715 and 3209 STAT 1400 and BIO SC 3650 or instructor's consent.

