

PLANT PATHOLOGY (PLP)

Courses primarily for undergraduates:

PLP 4080: Principles of Plant Path

(Dual-listed with PLP 5080).

Credits: 3. Contact Hours: Lecture 2, Laboratory 2.

Principles underlying the nature, diagnosis, and management of plant diseases. Laboratory complements lecture topics and provides experience in plant disease diagnosis. (Typically Offered: Fall, Spring)

PLP 4160: Forest Insects and Diseases

(Cross-listed with FOR 4160).

Credits: 3. Contact Hours: Lecture 2, Laboratory 2.

Nature of insects and pathogens of forest and shade trees; their role in the dynamics of natural and managed forest ecosystems; and the management of indigenous and exotic pests. Laboratory experience working with insect and fungal pests of trees. (Typically Offered: Fall)

PLP 4520: Integrated Management of Diseases and Insect Pests of Turfgrasses

(Dual-listed with PLP 5520/ ENT 5520/ HORT 5520). (Cross-listed with ENT 4520/ HORT 4520).

Credits: 3. Contact Hours: Lecture 3.

Prereq: HORT 3510

Identification and biology of important diseases and insect pests of turfgrasses. Development of integrated pest management programs in various turfgrass environments. Offered even-numbered years. (Typically Offered: Spring)

PLP 4770: Bacterial-Plant Interactions

(Dual-listed with MICRO 5770/ PLP 5770). (Cross-listed with MICRO 4770).

Credits: 3. Contact Hours: Lecture 3.

Prereq: 3 credits in MICRO or PLP

Overview of plant-associated bacteria including their ecology, diversity, and the physiological and molecular mechanisms involved with their interactions with plants. The course covers bacterial plant pathogens and pathogenesis, nitrogen fixation and plant symbioses, biological control and plant growth promotion, bacterial disease diagnosis and management, and approaches to the study of microbial communities in the rhizosphere and on leaves. Offered even-numbered years. (Typically Offered: Spring)

PLP 4900A: Independent Study: Plant Pathology

Credits: 1-3. Repeatable, maximum of 6 credits.

Prereq: 7 credits in BIOL; Junior or Senior classification; Permission of Instructor

Graduation Restriction: A maximum of 6 credits of PLP 4900 may be used toward the total of 128 credits required for graduation. (Typically Offered: Fall, Spring, Summer)

PLP 4900H: Independent Study: Honors

Credits: 1-3. Repeatable, maximum of 6 credits.

Prereq: 7 credits in BIOL; Junior or Senior classification; Permission of Instructor

Graduation Restriction: A maximum of 6 credits of PLP 4900 may be used toward the total of 128 credits required for graduation. (Typically Offered: Fall, Spring, Summer)

PLP 4940: Seed Pathology

(Dual-listed with PLP 5940).

Credits: 2. Contact Hours: Lecture 2.

Prereq: PLP 4080

Significance of biotic and abiotic diseases that affect the production and utilization of seeds, during each phase of the seed life cycle: growing, harvesting, conditioning, storing, and planting seed. Mechanisms of seed infection and seed-to-seedling transmission are considered for fungi, bacteria, viruses/viroids, and nematodes. Aspects of epidemiology, management, and host-pathogen relationships are discussed. Emphases include the role of seed health testing in the global seed industry for quality control and phytosanitary certification, as well as the use of seed treatments to manage seedborne and soilborne pathogens and pests. Concurrent enrollment in PLP 4940L/5940L (Seed Pathology Laboratory) is strongly encouraged (on-campus students only). Graduation Restriction: Credit may not be obtained for both PLP/STB 5920 and PLP 5940. Offered odd-numbered years. (Typically Offered: Fall)

PLP 4940L: Seed Pathology Laboratory

(Dual-listed with PLP 5940L).

Credits: 1. Contact Hours: Laboratory 3.

Prereq: PLP 4080

Laboratory in seed pathology. Seed health testing methods; effects of seed treatments and seed conditioning on seedborne pathogens. Offered odd-numbered years. (Typically Offered: Fall)

Courses primarily for graduate students, open to qualified undergraduates:

PLP 5060: Plant-Pathogen Interactions

Credits: 2. Contact Hours: Lecture 2.

Prereq: (BIOL 3130 and PLP 4080 or PLP 4160) or Graduate Classification

Introduction to mechanisms of plant-parasite interaction. Genetics and molecular genetics of plant disease resistance and pathogenicity. Offered odd-numbered years. (Typically Offered: Spring)

PLP 5080: Principles of Plant Pathology

(Dual-listed with PLP 4080).

Credits: 3. Contact Hours: Lecture 2, Laboratory 2.

Principles underlying the nature, diagnosis, and management of plant diseases. Laboratory complements lecture topics and provides experience in plant disease diagnosis. (Typically Offered: Fall, Spring)

PLP 5090: Plant Virology

(Cross-listed with MICRO 5090).

Credits: 2. Contact Hours: Lecture 1, Discussion 1.

Prereq: (BBMB 3010 or BIOL 3130) or Graduate Classification

Taxonomy, molecular mechanisms, host-interactions, vector transmission, epidemiology, detection, control and exploitation of plant viruses. Course will consist of a mixture of lectures, and student-led presentations using primary literature. Offered odd-numbered years. (Typically Offered: Spring)

PLP 5110: Integrated Management of Tropical Crops

(Cross-listed with ENT 5110/ HORT 5110).

Credits: 3. Contact Hours: Lecture 3.

Prereq: (ENT 3700 or ENT 3760 or HORT 2210 or PLP 4080 or PLP 4160) or Graduate Classification

Applications of Integrated Crop management principles (including plant pathology, entomology, and horticulture) to tropical cropping systems. Familiarization with a variety of tropical agroecosystems and Costa Rican culture is followed by a 10-day tour of Costa Rican agriculture during spring break, then writeup of individual projects. Offered odd-numbered years. Meets International Perspectives Requirement. (Typically Offered: Spring)

PLP 5120: Lifestyles of plant pathogenic fungi and oomycetes.

Credits: 2. Contact Hours: Lecture 2.

Exploration of the major groups of plant pathogenic fungi and oomycetes, focusing on the diseases they cause as well as pathogen ecology, diagnosis, crop resistance, and fungicide resistance. Offered odd-numbered years. (Typically Offered: Spring)

PLP 5300: Ecologically Based Pest Management Strategies

(Cross-listed with AGRON 5300/ ENT 5300/ SUSAG 5300).

Credits: 3. Contact Hours: Lecture 3.

Durable, least-toxic strategies for managing weeds, pathogens, and insect pests, with emphasis on underlying ecological processes. Offered even-numbered years. (Typically Offered: Fall)

PLP 5430: Ecology and Epidemiology of Plant Diseases

Credits: 3. Contact Hours: Lecture 3.

Prereq: (PLP 4080 or PLP 4160) or graduate classification

Nutter. Theory and practice related to the ecology and epidemiology of plant disease epidemics. Interactions among host and pathogen populations as affected by the environment are quantified with respect to time and space. Analysis of ecological and host and pathogen genetic factors that alter the course of plant disease epidemics. Risk assessment theory, disease forecasting, and modeling the impact of biotic plant stresses on yield and quality are also emphasized. Offered odd-numbered years. (Typically Offered: Fall)

PLP 5520: Integrated Management of Diseases and Insect Pests of Turfgrasses

(Dual-listed with PLP 4520/ ENT 4520/ HORT 4520). (Cross-listed with ENT 5520/ HORT 5520).

Credits: 3. Contact Hours: Lecture 3.

Prereq: HORT 3510 or Graduate Classification

Identification and biology of important diseases and insect pests of turfgrasses. Development of integrated pest management programs in various turfgrass environments. Offered even-numbered years. (Typically Offered: Spring)

PLP 5740: Plant Nematology

Credits: 2. Contact Hours: Lecture 2.

Morphology, anatomy, identification, management, and life cycles of common plant-parasitic nematodes; host parasite interactions; recent advances in plant nematology. Offered odd-numbered years. (Typically Offered: Fall)

PLP 5740L: Laboratory Techniques in Plant Nematology

Credits: 1. Contact Hours: Laboratory 3.

Practical skills of sample collection, processing, extraction, and identification of plant-parasitic nematodes from soil and roots; other techniques will be discussed. Offered odd-numbered years. (Typically Offered: Fall)

PLP 5770: Bacterial-Plant Interactions

(Dual-listed with MICRO 4770/ PLP 4770). (Cross-listed with MICRO 5770).

Credits: 3. Contact Hours: Lecture 3.

Prereq: (3 credits in MICRO or PLP) or Graduate Classification

Overview of plant-associated bacteria including their ecology, diversity, and the physiological and molecular mechanisms involved with their interactions with plants. The course covers bacterial plant pathogens and pathogenesis, nitrogen fixation and plant symbioses, biological control and plant growth promotion, bacterial disease diagnosis and management, and approaches to the study of microbial communities in the rhizosphere and on leaves. Offered even-numbered years. (Typically Offered: Spring)

PLP 5810: Experience in Plant Science Extension and Outreach

(Cross-listed with AGRON 5810/ ENT 5810/ HORT 5810).

Credits: 1.

A supervised learning experience in several extension delivery methods used in the plant sciences. Participation in Iowa State University-based extension programs that may include field crops horticulture, or Master Gardener programming. Offered odd-numbered years. (Typically Offered: Summer)

PLP 5900: Special Topics

Credits: 1-3. Repeatable.

Prereq: 10 credits in biological sciences, Permission of Instructor

(Typically Offered: Fall, Spring, Summer)

PLP 5920: Seed Health Management

(Cross-listed with STB 5920).

Credits: 2. Contact Hours: Lecture 2.

Occurrence and management of diseases during seed production, harvest, conditioning, storage, and planting. Emphasis on epidemiology, disease management in the field, seed treatment, effects of conditioning on seed health, and seed health testing. Graduation Restriction: Credit may not be obtained for both PLP/STB 5920 and PLP 5940. Offered even-numbered years. (Typically Offered: Spring)

PLP 5940: Seed Pathology

(Dual-listed with PLP 4940).

Credits: 2. Contact Hours: Lecture 2.

Prereq: PLP 4080 or Graduate Classification

Significance of biotic and abiotic diseases that affect the production and utilization of seeds, during each phase of the seed life cycle: growing, harvesting, conditioning, storing, and planting seed. Mechanisms of seed infection and seed-to-seedling transmission are considered for fungi, bacteria, viruses/viroids, and nematodes. Aspects of epidemiology, management, and host-pathogen relationships are discussed. Emphases include the role of seed health testing in the global seed industry for quality control and phytosanitary certification, as well as the use of seed treatments to manage seedborne and soilborne pathogens and pests. Concurrent enrollment in PLP 4940L/5940L (Seed Pathology Laboratory) is strongly encouraged (on-campus students only). Graduation Restriction: Credit may not be obtained for both PLP/STB 5920 and PLP 5940. Offered odd-numbered years. (Typically Offered: Fall)

PLP 5940L: Seed Pathology Laboratory

(Dual-listed with PLP 4940L).

Credits: 1. Contact Hours: Laboratory 3.

Prereq: PLP 4080 or Graduate Classification

Laboratory in seed pathology. Seed health testing methods; effects of seed treatments and seed conditioning on seedborne pathogens. Offered odd-numbered years. (Typically Offered: Fall)

PLP 5990: Creative Component

Credits: 1-30. Repeatable.

Independent study related to the student's area of specialization and approved by the student's major professor. (Typically Offered: Fall, Spring, Summer)

Courses for graduate students:**PLP 6080: Molecular Virology**

(Cross-listed with MICRO 6080/ VMPM 6080).

Credits: 3. Contact Hours: Lecture 3.

Prereq: BBMB 4050 or GDCB 5110

Advanced study of virus host-cell interactions. Molecular mechanisms of viral replication and pathogenesis. Offered even-numbered years. (Typically Offered: Fall)

PLP 6280: Improving Professional Presentation Skills

Credits: 2. Contact Hours: Lecture 2.

Skill building to improve oral presentation fundamentals for graduate students in biological sciences. Principles and guidance in both personal speaking style and maximizing impact of presentation software. In-depth lectures and class discussions on all aspects of presentation skills. Video and anonymous peer review of individual speeches. (Typically Offered: Spring)

PLP 6910: Field Plant Pathology

Credits: 2. Contact Hours: Laboratory 6.

Repeatable.

Prereq: (PLP 4080 or PLP 4160) or graduate classification

Diagnosis of plant diseases, plant disease assessment methods, and the integration of disease management into commercial crop production practices. Objectives are to familiarize students with common diseases of Midwest crops and landscape plants, and to provide experience in disease diagnosis. Field trips include commercial operations, agricultural research facilities, and ornamental plantings. Offered even-numbered years. (Typically Offered: Summer)

PLP 6920: Molecular Biology of Plant-Pathogen Interactions

(Cross-listed with MICRO 6920).

Credits: 3. Contact Hours: Lecture 3.

Seminar and current research in molecular and physiological aspects of plant interactions with pathogens, including mechanisms of pathogenesis, host-pathogen recognition and host defense, with an emphasis on critical evaluation of primary literature. Students also complete a research proposal writing and peer review exercise. Offered odd-numbered years. (Typically Offered: Spring)

PLP 6940: Colloquium in Plant Pathology

Credits: 2. Contact Hours: Lecture 2.

Repeatable.

Advanced topics in plant pathology, including biological control, cultural control, resistance gene deployment, genetic engineering for disease resistance, chemical control, integrated pest management, emerging diseases, fungal genetics, insect vector biology, professional communications, etc. (Typically Offered: Spring)

PLP 6980: Seminar

Credits: 1. Contact Hours: Lecture 1.

Repeatable.

Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring)

PLP 6990: Thesis and Dissertation Research

Credits: 1-30. Repeatable.

Thesis and dissertation research. (Typically Offered: Fall, Spring, Summer)