

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 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; Membership in the University Honors Program

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/STB 5940). (Cross-listed with STB 4940).

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/STB 5940L). (Cross-listed with STB 4940L).

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)

PLP 4960: Plant Pathology Travel Course

Credits: 3. Repeatable, maximum of 6 credits.

Agricultural production in unique regions of the world. Visit farms, industries and educational institutions for hands-on classes, tours, food tasting, and social interactions with students, researchers, farmers and business people. Location and duration of the travel will vary.

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 60) 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 Path

(Dual-listed with PLP 4080).

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

Prereq: Graduate Standing or Permission of Instructor

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 even-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 5300: Ecologically Based Pest Management Strategies

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

Credits: 3. Contact Hours: Lecture 3.

Prereq: Graduate Standing or Permission of Instructor

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

PLP 5440: Integrated Crop Protection

(Cross-listed with AGRON 5440).

Credits: 3. Contact Hours: Lecture 3.

Prereq: Graduate Standing or Permission of Instructor

Incorporation of the principles of integrated pest management and crop protection. Management systems (biological, cultural, chemical) and strategies which practice principles of weed science, plant pathology, and entomology. (Typically Offered: Spring)

PLP 5740: Plant Nematology

Credits: 2. Contact Hours: Lecture 2.

Prereq: Graduate Standing or Permission of Instructor

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.

Prereq: Graduate Standing or Permission of Instructor

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.

Prereq: Graduate Standing or Permission of Instructor

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 5940: Seed Pathology

(Dual-listed with PLP 4940/STB 4940). (Cross-listed with STB 5940).

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/STB 4940L). (Cross-listed with STB 5940L).

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 5970: Lab Methods for Plant Pathology Research

Credits: 2. Contact Hours: Laboratory 4.

Basic laboratory skills in plant pathology research taught through hands-on experience. A variety of phytopathogens and topics explored. (Typically Offered: Fall)

PLP 5990: Creative Component

Credits: 1-30. Repeatable.

Prereq: *Graduate Standing or Permission of Instructor*

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