

# PLANT PATHOLOGY (PL PATH)

## PL PATH/BOTANY 105 – MUSHROOMS

3 credits.

An introduction to fungi. The fungal kingdom is made up of millions of species. We use fungi to brew beer and make cheese, as medicines, and as symbols of both rampant decay and unstinting selflessness. Come unpack the mythology and walk away with a deep appreciation of a poorly understood but fascinating part of Earth's biodiversity.

**Requisites:** None

**Course Designation:** Breadth – Biological Sci. Counts toward the Natural Sci req

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

**Repeatable for Credit:** No

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Notice, recognize, and catalog fungi as you walk in the world; in Madison and in all of Earth's lands and waters.

Audience: Undergraduate

2. Explain the myriad ecological roles fungi play on planet Earth.

Audience: Undergraduate

3. Talk about fungal biodiversity at length and in depth.

Audience: Undergraduate

4. Think critically about the natural world; be able to not just read but also critique popular science writing.

Audience: Undergraduate

5. Interpret "how science gets done" and what constitutes scientific knowledge.

Audience: Undergraduate

## PL PATH/BOTANY 123 – PLANTS, PARASITES, AND PEOPLE

3 credits.

Explores the interaction between society and plant-associated microbes. Topics include: the Irish potato famine, pesticides in current agriculture, role of economics and consumer preference in crop disease management and the release of genetically engineered organisms.

**Requisites:** None

**Course Designation:** Breadth – Biological Sci. Counts toward the Natural Sci req

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

**Repeatable for Credit:** No

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Critically examine scientific issues that affect your life.

Audience: Undergraduate

2. Articulate the fundamental concepts from biological sciences that explain the essential roles of food, water, and air in sustaining life.

Audience: Undergraduate

3. Provide examples of how interactions between plants, microbes and human society impact our food, agriculture, environment, and the plant's ability to sustain our lives.

Audience: Undergraduate

4. Apply knowledge of the scientific process to conduct scientific investigations and discern how scientific knowledge differs from other types of knowledge.

Audience: Undergraduate

**PL PATH/ZOOLOGY 154 – TINY EARTH: ANTIBIOTIC DISCOVERY RESEARCH**

2 credits.

Learn basic methodology in scientific research and discovery, including laboratory techniques, quantitative reasoning, scientific communication, and collaboration. Gain hands-on laboratory experience working with microbes to test original hypotheses concerning the discovery of potential antibiotic compounds while addressing the world's antibiotic resistance crisis by contributing data to the global "Tiny Earth" network of researchers to advance potential drug development. Tiny Earth seeks to encourage students to pursue careers in science through real-world, applied research experiences and aims to address a worldwide health threat of the diminishing supply of effective antibiotics by "student-sourcing antibiotic discovery." Concurrent enrollment in BIOLOGY/BOTANY/ZOOLOGY 152 is required for permission to enroll.

**Requisites:** Consent of instructor**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Elementary

L&amp;S Credit - Counts as Liberal Arts and Science credit in L&amp;S

**Repeatable for Credit:** No**Last Taught:** Fall 2025

**Learning Outcomes:** 1. Demonstrate basic knowledge of microbes and antibiotic resistance by (1) sufficiently explaining the process of natural selection with the accurate use of terminology, (2) describing morphological and physiological variation in bacteria and how this relates to bacterial taxonomy, and (3) summarizing mechanisms of the spread of antibiotic resistance genes across the microbial world.

Audience: Undergraduate

2. Demonstrate scientific competency as shown by their ability to (1) propose an original research question and hypothesis, (2) develop a biological rationale for the hypothesis, (3) select appropriate protocols to test the hypothesis, and (4) perform the research collaboratively with group members in a cordial and respectful way.

Audience: Undergraduate

3. Demonstrate proper techniques in basic micro- and molecular biology by (1) pipetting fluids with volume accuracy, (2) plating microbes via spread, patch, and streak methods, (3) using proper sterile technique, and (4) performing protocols for polymerase chain reaction (PCR), gel electrophoresis, and BLAST analysis for DNA amplification and sequencing.

Audience: Undergraduate

4. Demonstrate quantitative reasoning as shown by their ability to (1) select an appropriate statistical analysis for a given data set and research question, (2) carry out the statistical analysis using a vetted program (e.g. online statistical calculator tool such as Vassarstats.com), and (3) accurately interpret and the translate the results into a meaningful statement.

Audience: Undergraduate

5. Demonstrate scientific communication as shown by their ability to (1) clearly express a hypothesis, general methodology, and results in formal writing, (2) accurately visualize numerical results in the form of graph, (3) satisfactorily deliver aspects of the research project and findings via oral presentation and scientific poster presentation.

Audience: Undergraduate

**PL PATH 155 – FOOD FRONTLINES: SECURITY, SUSTAINABILITY, AND SURVIVAL**

1 credit.

What does it mean to be food secure - and who gets left out? Interactively explore the scientific, social, and systemic forces that shape food insecurity locally and globally. Build a foundational understanding and then take a deep dive into key drivers of food insecurity - such as climate change, conflict, policy, and inequality - and examine how food access and production affect individuals, communities, and entire nations. Develop college success skills, reflect on personal and academic goals, and engage in evidence-based discussions that connect research, current events, and campus life.

**Requisites:** None**Repeatable for Credit:** No**Learning Outcomes:** 1. Identify resources and services available through CALS and UW-Madison.

Audience: Undergraduate

2. Identify and analyze key drivers of food insecurity and their impact on individuals and communities.

Audience: Undergraduate

3. Discuss scientific topics related to food (in)security.

Audience: Undergraduate

4. Explain how food production intersects with social, economic, and environmental systems.

Audience: Undergraduate

5. Describe foundational college success skills, including organization, critical thinking, and effective communication.

Audience: Undergraduate

6. Reflect on academic, career, and personal goals in relation to course themes.

Audience: Undergraduate

7. Discuss complex issues using evidence-based perspectives from research, current events, and college experiences.

Audience: Undergraduate

**PL PATH/PLANTSCI 261 – SUSTAINABLE TURFGRASS USE AND MANAGEMENT**

2 credits.

Sustainable use and management of turfgrass landscapes in urban and suburban environments, including home lawns, golf courses, and sports fields. Focus is on creating sustainable and attractive turfgrass landscapes through proper species selection, use of slow-release or organic fertilizer practices, and minimizing the use of pesticides and supplemental irrigation.

**Requisites:** None**Repeatable for Credit:** No**Last Taught:** Fall 2025**Learning Outcomes:** 1. Describe how turf is used in urban and suburban communities

Audience: Undergraduate

2. Identify the positive environmental impacts of using turfgrass

Audience: Undergraduate

3. Identify the negative environmental impacts of turfgrass management

Audience: Undergraduate

4. Identify the 3 major pest groups in turfgrass and describe sustainable management strategies for each

Audience: Undergraduate

**PL PATH/PLANTSCI 262 – TURFGRASS MANAGEMENT LABORATORY**

1 credit.

Hands-on turf establishment, cool- and warm-season grass, seed and weed identification, chemical application, and turf cultivation techniques and equipment use, plus field trips to major league sport facilities and golf courses.

**Requisites:** PL PATH/PLANTSCI 261 or concurrent enrollment**Repeatable for Credit:** No**Last Taught:** Fall 2024**Learning Outcomes:** 1. Identify the species of turfgrass commonly used in Wisconsin and the conditions they are most suited to.

Audience: Undergraduate

2. Describe management strategies that can be implemented to increase the sustainability of turfgrass management.

Audience: Undergraduate

3. List the most common pests observed on Wisconsin turfgrass and describe strategies for their sustainable management.

Audience: Undergraduate

4. Calculate the amount of seed needed to properly establish a turfgrass site, the amount of fertilizer needed to adequately fertilize turfgrass, and the concentration of pesticides needed to suppress common turfgrass pests.

Audience: Undergraduate

**PL PATH 289 – HONORS INDEPENDENT STUDY**

1-2 credits.

Research work for Honors students under direct guidance of a faculty member in an area of Plant Pathology. Students are responsible for arranging the work and credits with the supervising instructor.

**Requisites:** Consent of instructor**Course Designation:** Honors - Honors Only Courses (H)**Repeatable for Credit:** Yes, unlimited number of completions**Last Taught:** Spring 2000**Learning Outcomes:** 1. Develop critical, analytical, and independent thinking skills.

Audience: Undergraduate

2. Apply the scientific method and engage in constructive problem solving.

Audience: Undergraduate

3. Demonstrate application of research skills and methodologies.

Audience: Undergraduate

4. Effectively communicate findings.

Audience: Undergraduate

**PL PATH 299 – INDEPENDENT STUDY**

1-3 credits.

Research work for students under direct guidance of a faculty member in an area of Plant Pathology. Students are responsible for arranging the work and credits with the supervising instructor.

**Requisites:** Consent of instructor**Repeatable for Credit:** Yes, unlimited number of completions**Last Taught:** Fall 2025**Learning Outcomes:** 1. Develop critical, analytical, and independent thinking skills.

Audience: Undergraduate

2. Apply the scientific method and engage in constructive problem solving.

Audience: Undergraduate

3. Demonstrate application of research skills and methodologies.

Audience: Undergraduate

4. Effectively communicate findings.

Audience: Undergraduate

### PL PATH 300 – INTRODUCTION TO PLANT PATHOLOGY

4 credits.

Economic importance, symptoms, causes, and methods of control of representative plant diseases.

**Requisites:** (ZOOLOGY/BIOLOGY/BOTANY 152, BOTANY/BIOLOGY 130, or BIOCORE 381) or graduate/professional standing

**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Fall 2025

**Learning Outcomes:** 1. Describe the different types of plant pathogens in terms of biology and host-pathogen interactions.

Audience: Both Grad & Undergrad

2. Explain the importance of plant pathogens for agricultural production and food security.

Audience: Both Grad & Undergrad

3. Diagnose plant diseases using a combination of hands-on skills, course knowledge, and outside research.

Audience: Both Grad & Undergrad

4. Design a disease management plan using the concepts of integrated disease management.

Audience: Both Grad & Undergrad

5. Apply research skills and critically analyze literature to explore the importance of a plant disease outside of class.

Audience: Both Grad & Undergrad

6. Communicate with peers about a critically important plant disease and its societal/cultural impacts in both oral and written forms.

Audience: Both Grad & Undergrad

7. Evaluate current scientific literature in the field of plant pathology.

Audience: Graduate

### PL PATH 311 – GLOBAL FOOD SECURITY

3 credits.

Isn't having enough food a basic human right? Exploration of the drivers of food insecurity: barriers to food production (pests, land availability, climate), barriers to food availability (politics, price, biofuels), and a greater need due to population growth. Examination of solutions to food insecurity.

**Requisites:** Satisfied Communications A requirement

**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

**Repeatable for Credit:** No

**Last Taught:** Fall 2025

**Learning Outcomes:** 1. Locate, evaluate, and use credible information resources relevant to global food insecurity

Audience: Undergraduate

2. Analyze and interpret scientific evidence

Audience: Undergraduate

3. Compare and contrast information from multiple perspectives to gain a more comprehensive understanding of global food insecurity

Audience: Undergraduate

4. Demonstrate teamwork and interpersonal skills

Audience: Undergraduate

5. Analyze the barriers to food security

Audience: Undergraduate

6. Evaluate proposed solutions to food insecurity

Audience: Undergraduate

7. Apply logic-based rhetoric to communicate effectively in written and oral formats

Audience: Undergraduate

8. Demonstrate understanding of scientific reasoning, and determine when scientific information supports a given conclusion.

Audience: Undergraduate

**PL PATH 315 – PLANT MICROBIOMES**

4 credits.

Explore plant associated microbial communities (the plant microbiome), methods used to study them, and how we can use them to improve plant and ecosystem health in the face of challenges to agricultural and natural systems. Examples will be drawn from annual crop, grassland, and forested ecosystems. Use current molecular, bioinformatic, and statistical approaches to characterize rhizosphere microbiomes from samples collected as part of on-going research projects.

**Requisites:** (ZOOLOGY/BIOLOGY/BOTANY 152, ZOOLOGY/BIOLOGY 101 and 102, BOTANY/BIOLOGY 130, or BIOCORE 381) and (STAT 301 or 371), or Graduate/professional standing

**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Describe the major members of plant microbiomes and their functions.

Audience: Both Grad & Undergrad

2. Compare and contrast current and past approaches to studying plant microbiomes.

Audience: Both Grad & Undergrad

3. Use evidence to critically evaluate claims and test hypotheses.

Audience: Both Grad & Undergrad

4. Propose potential ways in which plant microbiomes may be utilized or manipulated to achieve societal goals.

Audience: Both Grad & Undergrad

5. Perform laboratory, bioinformatic and statistical protocols to characterize microbiome composition.

Audience: Both Grad & Undergrad

6. Propose, test, and interpret hypothesis about the structure of root associated microbial communities.

Audience: Both Grad & Undergrad

7. Evaluate scientific literature related to plant microbiomes and situate research results in the context of current literature.

Audience: Graduate

**PL PATH/BOTANY 332 – FUNGI**

4 credits.

Growth, development, variability and dispersal of saprophytic, parasitic, and symbiotic fungi, with a consideration of their ecological and economic significance. Develop skills in microscopy with live fungal materials.

**Requisites:** ZOOLOGY/BIOLOGY/BOTANY 151, BOTANY/BIOLOGY 130, ZOOLOGY/BIOLOGY 101, BIOCORE 381, or graduate/professional standing

**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Describe the biodiversity of true fungi (Eumycota) and other organisms traditionally included in studies of mycology.

Audience: Both Grad & Undergrad

2. Describe the fundamentals of fungal systematics, life cycles, genetics, pathology, evolution, ecology.

Audience: Both Grad & Undergrad

3. Describe the practical uses of fungi in agriculture, industry, medicine, and as model organisms.

Audience: Both Grad & Undergrad

4. Manipulate fungi in the laboratory by isolating and culturing them from the environment, use both dissecting and compound microscopes to see living and preserved organisms, extract and sequence their DNA, and implement bioinformatics pipelines.

Audience: Both Grad & Undergrad

5. Elucidate major unanswered questions in the field of mycology.

Audience: Graduate

### PL PATH/BOTANY 333 – BIOLOGY OF THE FUNGI

2 credits.

Growth, development, variability and dispersal of saprophytic, parasitic, and symbiotic fungi, with a consideration of their ecological and economic significance.

**Requisites:** ZOOLOGY/BIOLOGY/BOTANY 151, BOTANY/BIOLOGY 130, ZOOLOGY/BIOLOGY 101, BIOCORE 381, or graduate/professional standing

**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Will have a detailed knowledge of the biodiversity of Fungi, and organisms traditionally included in mycology courses, including but not limited to systematics, life cycles, genetics, pathology, ecology.

Audience: Both Grad & Undergrad

2. Apply knowledge of Fungi and fungal-like organisms for use in agriculture and industry.

Audience: Both Grad & Undergrad

3. Communicate about fungi in either an outreach or professional capacity.

Audience: Graduate

### PL PATH/A A E/PLANTSCI 367 – INTRODUCTION TO ORGANIC AGRICULTURE: PRODUCTION, MARKETS, AND POLICY

3 credits.

Provides an in-depth understanding of the history of organic agriculture, its production, processing, marketing, and social dimensions, and its impact on environmental, community, and human health.

**Requisites:** ENVIR ST/AGROECOL/C&E SOC/ENTOM 103, AGRONOMY 100, HORT 120, PLANTSCI 110, BOTANY/PL PATH 123, SOC/C&E SOC 222, or graduate/professional standing

**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Describe the history of current organic systems and how it influences the way that organic farms and industries work.

Audience: Both Grad & Undergrad

2. Explore the biological, ecological, and agricultural underpinnings of organic production systems.

Audience: Both Grad & Undergrad

3. Examine how organic systems, social initiatives, and regulations are developed and how they shape business activities, community development efforts, and human and environmental health outcomes.

Audience: Both Grad & Undergrad

4. Evaluate the benefits and limitations of organic systems, social initiatives, and regulations from environmental, social, economic, and racial justice perspectives.

Audience: Both Grad & Undergrad

5. Analyze sustainability issues and/or practices using a systems-based approach.

Audience: Both Grad & Undergrad

6. Describe the social, economic, and environmental dimensions of organic farming and identify potential tradeoffs and interrelationships among these dimensions at a level appropriate to the course.

Audience: Both Grad & Undergrad

7. Develop the capacity to evaluate sustainability and resilience outcomes of organic and other agricultural production and processing systems using interdisciplinary methods.

Audience: Graduate

**PL PATH 375 – SPECIAL TOPICS**

1-4 credits.

Subjects of current interest to undergrads.

**Requisites:** None**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&amp;S Credit - Counts as Liberal Arts and Science credit in L&amp;S

**Repeatable for Credit:** Yes, unlimited number of completions**Last Taught:** Fall 2025**PL PATH 399 – COORDINATIVE INTERNSHIP/COOPERATIVE EDUCATION**

1-8 credits.

An internship under guidance of a faculty or instructional academic staff member in Plant Pathology and internship site supervisor. Students are responsible for arranging the work and credits with the faculty or instructional academic staff member and the internship site supervisor.

**Requisites:** Consent of instructor**Course Designation:** Level - Advanced

L&amp;S Credit - Counts as Liberal Arts and Science credit in L&amp;S

Workplace - Workplace Experience Course

**Repeatable for Credit:** Yes, for 8 number of completions**Last Taught:** Spring 2020**Learning Outcomes:** 1. Apply concepts learned in coursework to authentic professional situations.

Audience: Undergraduate

2. Demonstrate professional skills appropriate for the industry.

Audience: Undergraduate

3. Identify and reflect on how concepts learned in coursework apply to specific work settings and situations.

Audience: Undergraduate

**PL PATH 400 – STUDY ABROAD IN PLANT PATHOLOGY**

1-6 credits.

Provides an area equivalency for courses taken on Madison Study Abroad Programs that do not equate to existing UW courses. Current enrollment in a UW-Madison study abroad program

**Requisites:** None**Repeatable for Credit:** Yes, unlimited number of completions**PL PATH 499 – INDEPENDENT STUDY IN ORGANIC AGRICULTURE**

2 credits.

Provide students research and/or hands-on experiences within the organic sector in order to gain scientific knowledge and/or an in-depth understanding of the research and science of organic agriculture, its production, processing, marketing, and social dimensions, and its impact on environmental, community, and human health. Declared in the Certificate in Organic Agriculture

**Requisites:** Consent of instructor**Course Designation:** Level - Intermediate

L&amp;S Credit - Counts as Liberal Arts and Science credit in L&amp;S

**Repeatable for Credit:** Yes, unlimited number of completions**Last Taught:** Spring 2026**Learning Outcomes:** 1. Apply knowledge of organic production through experiential opportunities within local, national and/or international communities.

Audience: Undergraduate

2. Research and/or develop innovations that integrate the biological, ecological, social, and economic concepts of organic agriculture into scientific or practical applications supporting organic farmers, industry participants, and/or consumers.

Audience: Undergraduate

**PL PATH/BOTANY/ENTOM 505 – PLANT-MICROBE INTERACTIONS: MOLECULAR AND ECOLOGICAL ASPECTS**

3 credits.

Molecular and ecological aspects of the interactions between plants and microorganisms. Explores many of the themes, from genetic to integrative, of modern biology, and illustrates how study of plant-microbe interactions contributes to understanding of fundamental plant science.

**Requisites:** MICROBIO 303, GENETICS 466, 468, BIOCHEM 501, 508, or graduate/professional standing**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&amp;S Credit - Counts as Liberal Arts and Science credit in L&amp;S

Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No**Last Taught:** Spring 2026**Learning Outcomes:** 1. Assess research papers from the peer-reviewed science literature by critically reading.

Audience: Both Grad &amp; Undergrad

2. Discuss our current understanding of molecular plant-microbe interactions.

Audience: Both Grad &amp; Undergrad

3. Present ideas at a professional level, in both oral and written form.

Audience: Both Grad &amp; Undergrad

4. Facilitate an in-depth discussion about the complex relationships between plants and microbes.

Audience: Graduate

### **PL PATH 517 – PLANT DISEASE RESISTANCE**

2-3 credits.

Host resistance in plant disease control. Conceptual and applied aspects of resistance: how it works, why it sometimes fails, and the traditional and modern techniques used for evaluating host resistance and incorporating resistance factors into new plant varieties.

**Requisites:** PL PATH 300, GENETICS 466, 468, PLANTSCI 338 or AGRONOMY 338 prior to Fall 2025, PLANTSCI 501 or AGRONOMY 501 prior to Fall 2025, or graduate/professional standing

**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Fall 2024

**Learning Outcomes:** 1. Discuss our current understanding of plant disease resistance at multiple levels (e.g., organismal, genetic, in field vs. controlled environments, molecular mechanisms).

Audience: Both Grad & Undergrad

2. Outline standard and modern approaches to plant disease resistance breeding.

Audience: Both Grad & Undergrad

3. Critically evaluate research papers from the peer-reviewed science literature.

Audience: Both Grad & Undergrad

4. Articulate concepts related to plant disease resistance with professional proficiency in both verbal and written forms.

Audience: Both Grad & Undergrad

5. Facilitate an in-depth discussion of a case study concerning use of recent scientific discoveries in breeding for plant disease resistance.

Audience: Graduate

### **PL PATH 559 – DISEASES OF ECONOMIC PLANTS**

3 credits.

Symptoms, epidemiology and control of diseases of crop plants; emphasis on disease diagnosis.

**Requisites:** (PL PATH 300 and 332), or graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Summer 2024

**Learning Outcomes:** 1. Describe the impact of plant disease on economically important cropping systems in Wisconsin.

Audience: Both Grad & Undergrad

2. Articulate a critical perspective on land use and explain how agriculture impacts human and environmental health.

Audience: Both Grad & Undergrad

3. Develop analytical thinking and communication skills through class readings, activities, and discussion.

Audience: Both Grad & Undergrad

4. Describe the diverse, economic plant industries in Wisconsin and how plant diseases affect them.

Audience: Graduate

5. Describe the main diseases and their management practices in agronomic and specialty crops, and in turf and ornamental systems.

Audience: Graduate

6. Apply scientific principles of disease diagnostics and pathogen lifecycles to make disease management decisions.

Audience: Graduate

7. Acquire new knowledge of insects, weed, nutrient disorders and injury caused by abiotic factors.

Audience: Graduate

**PL PATH/BOTANY 563 – PHYLOGENETIC ANALYSIS OF MOLECULAR DATA**

3 credits.

Theory and practice of phylogenetic inference from DNA sequence data.

**Requisites:** (ZOOLOGY/BIOLOGY/BOTANY 151, BOTANY/BIOLOGY 130, ZOOLOGY/BIOLOGY 101, or BIOCORE 381) and (STAT 240, 301, 324, or 371) or graduate/professional standing

**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Explain in details all the steps in the pipeline for phylogenetic inference and how different data and model choices affect the inference outcomes

Audience: Both Grad & Undergrad

2. Plan and produce reproducible scripts with the analysis of real biological data

Audience: Both Grad & Undergrad

3. Justify the data and model choices made for the data analysis

Audience: Both Grad & Undergrad

4. Interpret the results of the most widely used phylogenetic methods in biological terms

Audience: Both Grad & Undergrad

5. Orally present the results of phylogenomic data analyses based on the best scientific and reproducibility practices

Audience: Graduate

**PL PATH 590 – CAPSTONE IN PLANT PATHOLOGY**

1-4 credits.

Synthesizing research-based capstone experience in Plant Pathology. Develop problem-solving skills, be exposed to multidisciplinary approaches, develop teamwork and interpersonal skills, develop information resources, consider societal, economic, ethical, scientific and professional aspects of the field, and prepare and present written and/or oral reports.

**Requisites:** Consent of instructor

**Course Designation:** Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

**Repeatable for Credit:** Yes, unlimited number of completions

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Integrate diverse approaches to solve problems or answer questions related to plant-microbe interactions.

Audience: Undergraduate

2. Evaluate the strength and value of diverse information sources in plant pathology and/or related fields.

Audience: Undergraduate

3. Discuss specific issues related to plant pathology with peers.

Audience: Undergraduate

4. Situate plant pathology and plant-microbial interactions research into broader societal contexts.

Audience: Undergraduate

5. Write and present reports regarding plant disease or plant-microbial interactions for both scientific and general audiences.

Audience: Undergraduate

**PL PATH 602 – ECOLOGY, EPIDEMIOLOGY AND CONTROL OF PLANT DISEASES**

3 credits.

Environmental factors in the development and spread of diseases, pathogen variability, genetics of disease resistance, and principles of disease control.

**Requisites:** PL PATH 300, (MATH 217 or 221), and (STAT 301, 371, or F&W ECOL/STAT 571), or graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Fall 2024

**Learning Outcomes:** 1. Model disease progress over time and space.

Audience: Both Grad & Undergrad

2. Connect population scale phenomena to individual organism interactions.

Audience: Both Grad & Undergrad

3. Design empirical studies of epidemics.

Audience: Both Grad & Undergrad

4. Model how biotic and abiotic conditions affect epidemic dynamics.

Audience: Both Grad & Undergrad

5. Compare and contrast causes and consequences of disease in natural and managed systems.

Audience: Both Grad & Undergrad

6. Evaluate relative benefits of disease management tools.

Audience: Both Grad & Undergrad

7. Design rational management strategies based on understanding of epidemic dynamics.

Audience: Both Grad & Undergrad

8. Synthesize current scientific literature related to ecology, epidemiology, and plant diseases.

Audience: Graduate

**PL PATH 622 – PLANT-BACTERIAL INTERACTIONS**

2-3 credits.

Physiology, genetics, taxonomy, and ecology of bacterial pathogens, epiphytes, and symbionts of plants.

**Requisites:** MICROBIO 303 and (GENETICS 466, 468, BIOCHEM 501, or 508) or graduate/professional standing

**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Fall 2019

**Learning Outcomes:** 1. Master unifying concepts and factual material about the biology of plant-associated bacteria.

Audience: Both Grad & Undergrad

2. Describe emerging research challenges, both technical and conceptual, in the field.

Audience: Both Grad & Undergrad

3. Analyze biological research papers.

Audience: Both Grad & Undergrad

4. Integrate current or proposed research with contemporary scientific literature related to plant-bacterial interactions.

Audience: Graduate

**PL PATH/M M & I/ONCOLOGY 640 – GENERAL VIROLOGY-MULTIPLICATION OF VIRUSES**

3 credits.

The structure, multiplication, genetics, pathology and control of animal and plant viruses.

**Requisites:** (GENETICS 466 or 467) and (BIOCHEM 501 or 508) or graduate/professional standing

**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Fall 2025

**Learning Outcomes:** 1. Identify the major classes of viruses infecting animals and plants, and summarize their basic replication strategies.

Audience: Both Grad & Undergrad

2. Identify the major innate and adaptive antiviral immunity mechanisms of animals and plants, and examples of viral countermeasures against these.

Audience: Both Grad & Undergrad

3. Summarize the burdens and threats of viruses to public health, agriculture, etc.

Audience: Both Grad & Undergrad

4. Identify the major approaches and challenges to virus control at the single organism and host population levels, including why viruses are generally harder to control than bacteria, and major steps in developing new antiviral agents.

Audience: Both Grad & Undergrad

5. Illustrate beneficial uses of viruses and their genes in research, biotechnology and medicine.

Audience: Both Grad & Undergrad

6. Design and evaluate basic experiments to address specific questions in virology.

Audience: Both Grad & Undergrad

7. Read and evaluate primary literature papers in virology.

Audience: Graduate

**PL PATH/BOTANY/GENETICS/M M & I 655 – BIOLOGY AND GENETICS OF FUNGI**

3 credits.

Fungal genetics, genomics, and physiology using plant pathogenic fungi and the genetic models *Aspergillus nidulans* and *Neurospora crassa* as model systems to explore the current knowledge of fungal genetics and plant/fungal interactions.

**Requisites:** Graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Fall 2024

**Learning Outcomes:** 1. Demonstrate a basic understanding of fungal biology and genetics

Audience: Graduate

2. Analyze current research topics in fungal genetics/biology

Audience: Graduate

3. Identify members of the fungal research community

Audience: Graduate

4. Write and critique research grants

Audience: Graduate

5. Critique and discuss peer reviewed manuscripts

Audience: Graduate

6. Develop and deliver oral presentations (research paper and own research)

Audience: Graduate

7. Improve communication skills (oral and written)

Audience: Graduate

**PL PATH 681 – SENIOR HONORS THESIS**

2-4 credits.

Individual study for undergraduate students in an Honors program completing a thesis in the area of Plant Pathology, as arranged with a faculty member.

**Requisites:** Consent of instructor

**Course Designation:** Honors - Honors Only Courses (H)

**Repeatable for Credit:** No

**Last Taught:** Fall 2025

**Learning Outcomes:** 1. Review and analyze scientific literature.

Audience: Undergraduate

2. Identify and use appropriate research methodologies to address a research question.

Audience: Undergraduate

3. Begin structuring and writing a thesis based on original research.

Audience: Undergraduate

### **PL PATH 682 – SENIOR HONORS THESIS**

2-4 credits.

Second semester of individual study for undergraduate students in an Honors program completing a thesis in the area of Plant Pathology, as arranged with a faculty member.

**Requisites:** Consent of instructor

**Course Designation:** Honors - Honors Only Courses (H)

**Repeatable for Credit:** No

**Last Taught:** Spring 2019

**Learning Outcomes:** 1. Review and analyze scientific literature.

Audience: Undergraduate

2. Identify and use appropriate research methodologies to address a research question.

Audience: Undergraduate

3. Write a thesis based on original research.

Audience: Undergraduate

### **PL PATH 699 – SPECIAL PROBLEMS**

1-5 credits.

Individual advanced work in an area of Plant Pathology under the direct guidance of a faculty member.

**Requisites:** Consent of instructor

**Course Designation:** Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

**Repeatable for Credit:** Yes, unlimited number of completions

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Develop critical, analytical, and independent thinking skills.

Audience: Undergraduate

2. Apply the scientific method and engage in constructive problem solving.

Audience: Undergraduate

3. Demonstrate application of research skills and methodologies.

Audience: Undergraduate

4. Effectively communicate findings.

Audience: Undergraduate

### **PL PATH 799 – PRACTICUM IN PLANT PATHOLOGY TEACHING**

1-3 credits.

Instructional orientation to teaching at the higher education level in the agricultural and life sciences, direct teaching experience under faculty supervision, experience in testing and evaluation of students, and the analysis of teaching performance.

**Requisites:** Consent of instructor

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Communicate knowledge of Plant Pathology to a general audience.

Audience: Graduate

2. Gain teaching experience to build a teaching portfolio.

Audience: Graduate

3. Prepare appropriate lesson plans for classroom instruction and/or activities.

Audience: Graduate

4. Monitor student performance and progress through assessment and analysis.

Audience: Graduate

5. Implement classroom practices to create a safe learning environment for students, manage time, address classroom demands, and respond to diverse student needs.

Audience: Graduate

6. Demonstrate instructional strategies to engage students in the science of Plant Pathology.

Audience: Graduate

7. Collaborate with other instructors to accomplish the goals of the course.

Audience: Graduate

### **PL PATH 875 – SPECIAL TOPICS**

1-4 credits.

Topics of current interest to Grad students.

**Requisites:** Graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** Yes, unlimited number of completions

**Last Taught:** Spring 2026

**PL PATH 923 – SEMINAR**

1 credit.

Seminar series on topics related to plant pathology

**Requisites:** Graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** Yes, unlimited number of completions

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Devise an engaging overview of a research area.

Audience: Graduate

2. Explain background, methods, results, and a discussion of experimental data.

Audience: Graduate

3. Design visualizations that effectively communicate data.

Audience: Graduate

4. Evaluate and provide constructive feedback on the effectiveness of scientific presentations by peers.

Audience: Graduate

5. Generate goals to improve presentation skills.

Audience: Graduate

**PL PATH/BOTANY 930 – SEMINAR-MYCOLOGY**

1 credit.

Topics, recent advances literature in the area of Mycology.

**Requisites:** Graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** Yes, unlimited number of completions

**Last Taught:** Fall 2025

**Learning Outcomes:** 1. Assess current studies and methodologies in the study of fungi.

Audience: Graduate

**PL PATH 990 – RESEARCH**

1-9 credits.

Independent laboratory research in preparation of a graduate thesis under supervision of a faculty member

**Requisites:** Consent of instructor

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** Yes, unlimited number of completions

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Develop critical, analytical, and independent thinking skills.

Audience: Graduate

2. Apply the scientific method to address current questions in plant pathology and/or plant-microbial interactions.

Audience: Graduate

3. Perform necessary research methodologies to generate novel data.

Audience: Graduate

4. Effectively communicate findings to scientific audiences.

Audience: Graduate