

PLANT PATHOLOGY (PPATH)

PPATH 502: Plant Disease Diagnosis

3 Credits

Field and laboratory techniques used in diagnosing plant diseases caused by various types of pathogens with emphasis on fungi.

Prerequisite: PPATH401

PPATH 505: Fundamentals of Phytopathology

4 Credits

An in-depth tutorial of the fundamental theories and concepts of plant pathology. PPATH 505 Fundamentals of Phytopathology (2) Using the primary literature of the discipline, students will explore, in-depth, the knowledge base of plant pathology. Students will write a 3-5 page paper each week summarizing the major points of the topic covered in the primary literature assigned as related to 4 pathogens/diseases chosen by each student from an approved list. Students will also answer, in writing, 1-2 specific questions posed by the instructor each week. These writings constitute 90% of the grade. 5% of the grade is based upon a written final exam and 5% on oral participation in class.

Prerequisite: PPEM 405

PPATH 522: Professional Development & Ethics in Plant Pathology

1 Credits

Graduate students will develop key professional skills and ethics through a combination of lectures, discussions, and assignments. PPATH 522 Professional Development & Ethics in Plant Pathology (1) This course is designed to help graduate students acquire key professional skill and ethics through a combination of lectures, case study discussions on various ethics and professionalism issues, dialogs with invited guests about their professional experience, and mock exercises of paper and proposal reviews. Topics to be covered include: (a) the process and ethics of publishing, (b) how peer review of papers and grant proposals works, (c) plagiarism, (d) scientific misconduct, (c) oral and poster presentation skill, and (f) successful strategies in grant proposal writing and proposal review.

PPATH 533: Molecular Genetics of Plant-Pathogen Interactions

3 Credits

In depth discussion/review of the primary literature on the mechanisms of plant-pathogen interactions at the molecular and cellular levels. PPATH 533 Molecular Genetics of Plant-Pathogen Interactions (3) The main objective of this 3-credit course is to help students gain (a) firsthand knowledge of various techniques used in studying the molecular basis of plant-pathogen interactions and (b) knowledge of the current concepts and theories on the nature and mechanisms of the plant-pathogen interactions. In addition, this course will help students develop an ability to integrate and synthesize various areas of knowledge in solving plant health related problems. This course will serve the needs of students in Plant Pathology and other departments/programs who require an in-depth understanding of the molecular basis of plant-pathogen interactions for their program of study. This course will be offered in fall of even numbered years, and its expected enrollment is 8-10. Grading will

be based on class participation, paper presentations, assignments, and a mid-term exam.

Prerequisite: B M B400 or equivalent

PPATH 542: Epidemiology of Plant Diseases

3 Credits

Disease development in populations of plants, with emphasis on the impact of environment and control practices on rate of development.

Prerequisite: PPATH401 ; MATH 111 or MATH 141 or 3 credits in statistics

PPATH 544: Fungal Genetics

4 Credits

Fungal breeding systems, mating types, asexual restrictions and recombination, tetrad analysis, gene conversion and extra genetic elements. PPATH 544 Fungal Genetics (4) Fungal genetics will focus on the classical genetics of fungi starting with the expected inheritance ratios and patterns for single gene and multiple genes on various fungal traits. The methods of establishing crosses and obtaining progeny will be covered in the examples provided. Mating type and breeding systems are an important trait for obtaining the sexual phase, therefore an emphasis will be placed on the genetic determination of breeding methods and mating type, and what is known of mating type switching. There are several unique phenotypes associated only with fungi (pokey, senescent fungi, killer character and others) inherited by mitochondrial DNA and induced by plasmids or transposons. The determination of inheritance and the importance will be examined. Fungi provide the unique opportunity to conduct tetrad analysis in determination of inheritance and mapping of traits. In the laboratory, crosses will be set up by students to obtain data to conduct tetrad analysis and to visualize unusual tetrads brought about by gene conversion. Exchange of genetic material occurs without the sexual cycle though heterokaryosis and the parasexual cycle but may be limited by vegetative incompatibility. These difficult concepts will be discussed as well as visualized by conducting experiments in the laboratory. In discussions, an emphasis will be placed on plant pathogenic fungi and inheritance of virulence which is an important plant pathogen trait. Finally topics on population genetics of fungi including determination of genetic diversity, allele frequencies, genotype frequencies will be studied. Evaluation of student performance will be based on problems sets provided throughout the semester, laboratory reports, student projects and presentations, and a final examination. The problem sets are designed to help students solve genetic problems based on the concepts learned in lecture. The laboratory experiments are designed to complement the lectures and allow students to visualize difficult concepts from lecture. Students will be assigned a plant pathogenic fungus and will explore the literature especially any relevant genetic information on that fungus. The final examination will focus on short answer questions requiring the student to synthesize information. The course will be offered every other spring semester even years. Expected enrollment is 10 students.

Prerequisite: 3 credits of mycology and introductory genetics

PPATH 555: Effective Scientific Communications

3 Credits

Students will learn to effectively present their research to scientific and non-scientific audiences. The overall goal of the course is to

develop student skills in spoken and written communication of scientific concepts, methods, and data, and to provide effective evidence-based recommendations for practical application of such knowledge. In addition, students will develop skills in writing testable hypotheses, evaluating experimental approaches, considering alternative approaches, and envisioning expected outcomes of a research plan.

PPATH 590: Colloquium

1-3 Credits/Maximum of 3

Continuing seminars which consist of a series of individual lectures by faculty, students, or outside speakers.

PPATH 596: Individual Studies

1-9 Credits/Maximum of 9

Creative projects, including nonthesis research, which are supervised on an individual basis and which fall outside the scope of formal courses.

PPATH 597: Special Topics

1-9 Credits/Maximum of 9

Formal courses given on a topical or special interest subject which may be offered infrequently; several different topics may be taught in one year or term.

PPATH 600: Thesis Research

1-15 Credits/Maximum of 999

No description.

PPATH 601: Ph.D. Dissertation Full-Time

0 Credits/Maximum of 999

No description.

PPATH 602: Supervised Experience in College Teaching

1-3 Credits/Maximum of 6

Supervised preparation and presentation of materials in lectures and laboratories, preparation and supervision of exams and student consultation and evaluation.

PPATH 610: Thesis Research Off Campus

1-15 Credits/Maximum of 999

No description.

PPATH 611: Ph.D. Dissertation Part-Time

0 Credits/Maximum of 999

No description.

PPATH 802: Plant Protection: Responding to Introductions of Threatening Pests and Pathogens

3 Credits

This course provides knowledge of plant biosecurity, plant disease, regulations, and technologies using case study examples.

Cross-listed with: AGBIO 802

PPATH 840: Major Writing Projects: Start to Finish

3 Credits

In this course, students will work through a major STEM writing project (e.g. thesis proposal, review article), with the goal of having a completed project at the end of the course. Individual student goals will be agreed upon at the outset of the course by the student, the major adviser to the student, and the course instructor. Students in the course will follow a rigorous writing schedule that requires writing submissions and peer reviews most weeks. In addition to submitting and reviewing writing, students will learn a variety of relevant writing skills through both lectures and practical activities.

PPATH 853: Interpreting Turfgrass Science Literature

3 Credits

Introduction to turfgrass research publications, interpretation of the data, and discussion of the significance of the results. PPATH (TURF) 853 Interpreting Turfgrass Science Literature (3) This course will provide an introduction to literature search in turfgrass management, identification of most pertinent peer-reviewed journals for each area of interest/specialty in turfgrass management, and utilization of other resources such as technical journals, trade journals, online and resident educational material resources, extension bulletins/circulars from various institutions/organizations that addresses various topics on turfgrass management. This course will prepare the students for analyzing research questions or rationale formulated by an investigator, for understanding how the study was devised to address the objectives adequately and the results were obtained and presented in the publication, and for identifying the take-home message in the publication. Emphasis will be made on the criteria used for data collection, the significance of methods employed in statistical analyses of the data, and presentation of results in the publications to effectively convey the information to readers.

Cross-listed with: TURF 853