PLANT PATHOLOGY, M.S.

The discipline of plant pathology is directed toward understanding and solving disease problems of plants. The field is broad and complex, integrating disciplines as varied as molecular biology, genetics, cell biology, organismal biology, population and community ecology, meteorology, statistics, computer science, chemistry, and physics. Plant pathology encompasses basic and applied research, employs both model systems and economically important plants, and requires both laboratory and field experimentation. Active research programs in the department encompass this full spectrum of questions and approaches, including research on biological control, virology, nematology, fungal genetics, tissue culture, soil microbiology and ecology, forest pathology, bacterial plant pathogens, molecular biology of parasite–host interactions, microbial ecology, epidemiology, and integrated disease management strategies.

The graduate program in plant pathology educates students in the science of plant pathology and prepares them for successful careers. Students develop the following skills required to meet diverse professional situations: excellence in research, breadth and depth in plant pathology, breadth in an allied field, strong critical and analytical thinking skills, and effective communication skills. Students become sufficiently knowledgeable in all aspects of plant pathology to identify key research questions, recognize significant discoveries, and think analytically about interpretation of data.

The level of proficiency in specific areas will vary with the student’s research area and career goals, and will be appropriate to the student’s degree program (M.S. or Ph.D.). Specific areas of proficiency addressed by the Ph.D. curriculum include etiology, diagnosis, and management of plant disease; ecology and epidemiology; genetics and physiology of plant–microbe interactions; and organismal biology. Ph.D. students may elect an optional professional development experience as part of their curriculum. Graduates of the program attain positions in teaching, research in academic positions, government services, industry, extension services, and private practice.

The program is comprised of about 100 faculty members, graduate students, and research and support staff. It is housed in an eight-story wing of Russell Laboratories, a teaching and research facility on the UW–Madison campus, which is surrounded by other facilities that are also devoted to biological research. Russell Labs, together with the extensive research facilities available on the rest of the UW–Madison campus and at field research stations throughout Wisconsin, provide a rich and comprehensive environment for research and graduate studies in all branches of plant pathology.

FUNDING

The department offers stipends to the most highly qualified applicants, and in-course students are funded throughout their programs by research assistantships, fellowships, or traineeships. The department nominates outstanding students for external fellowships, and supports and assists students who apply for scholarships and other forms of financial support.

REQUIREMENTS

MINIMUM DEGREE REQUIREMENTS AND SATISFACTORY PROGRESS

To make progress toward a graduate degree, students must meet the Graduate School Minimum Degree Requirements and Satisfactory Progress (http://guide.wisc.edu/graduate/#policiesandrequirementstext) in addition to the requirements of the program.

MASTER’S DEGREES

M.S.

MINIMUM GRADUATE DEGREE CREDIT REQUIREMENT

30 credits

MINIMUM GRADUATE RESIDENCE CREDIT REQUIREMENT

16 credits

MINIMUM GRADUATE COURSEWORK (50%) REQUIREMENT

At least 50% of credits applied toward the graduate degree credit requirement must be in graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university’s Course Guide (http://my.wisc.edu/CourseGuideRedirect/BrowseByTitle).

PRIOR COURSEWORK REQUIREMENTS: GRADUATE WORK FROM OTHER INSTITUTIONS

With M.S. committee approval and Academic Affairs Committee approval, students are allowed to count no more than 14 credits of graduate coursework from other institutions. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

PRIOR COURSEWORK REQUIREMENTS: UW–MADISON UNDERGRADUATE

Students may count up to 7 credits of coursework numbered 300 level or above upon approval of the M.S. committee and the Academic Affairs Committee. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

PRIOR COURSEWORK REQUIREMENTS: UW–MADISON UNIVERSITY SPECIAL

With M.S. committee approval and Academic Affairs Committee approval, students are allowed to count no more than 15 credits of coursework numbered 300 or above taken as a UW–Madison special student. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

CREDITS PER TERM ALLOWED

15 credits

PROGRAM-SPECIFIC COURSES REQUIRED

9 credits of plant pathology must include PL PATH 300 Introduction to Plant Pathology (or equivalent), must include at least 1 credit of PL PATH 875 Special Topics, must include 1 credit of PL PATH 923
Seminar. The remaining 21 credits of electives can include up to 15 credits of PL PATH 990 Research.

**OVERALL GRADUATE GPA REQUIREMENT**

3.00

**OTHER GRADE REQUIREMENTS**

The Graduate School requires an average grade of B or better in all coursework (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.

**PROBATION POLICY**

The Graduate School regularly reviews the record of any student who earned grades of BC, C, D, F, or Incomplete in a graduate course (300 or above), or grade of U in research credits. This review could result in academic probation with a hold on future enrollment or in being suspended from the Graduate School.

**ADVISOR / COMMITTEE**

Every graduate student is required to have an advisor. To ensure that students are making satisfactory progress toward a degree, the Graduate School expects them to meet with their advisor on a regular basis.

An advisor generally serves as the thesis advisor. In many cases, an advisor is assigned to incoming students. Students can be suspended from the Graduate School if they do not have an advisor. An advisor is a faculty member, or sometimes a committee, from the major department responsible for providing advice regarding graduate studies.

A committee often accomplishes advising for the students in the early stages of their studies.

**ASSESSMENT AND EXAMINATIONS**

Contact the program for information on required assessments and examinations.

**TIME CONSTRAINTS**

Master’s degree students who have been absent for five or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

**LANGUAGE REQUIREMENTS**

Contact the program for information on any language requirements.

**ADMISSIONS**

Students who are admitted to the department must meet the Graduate School requirements, including completion of a bachelor’s degree which typically consists of courses in biology, chemistry, physics, and math. If foundation course requirements have not been fulfilled before matriculation, they must be completed as early as possible in the course of study. Successful applicants typically exceed the minimum requirement of a 3.0 GPA (on a 4.0 scale); exceed the minimum required Test of English as a Foreign Language (TOEFL) score of 92, or a 7 on the International English Language Testing System (IELTS) exam (international applicants); perform well on the Graduate Record Exam (GRE); and articulate a strong interest in the discipline in their application.

Prior research experience is an asset for any applicant, and letters of recommendation from research advisors are viewed as one of the most useful means of evaluating applications.

The application deadline for the fall semester is the preceding January 2. Applications received after that date will be reviewed, but they are disadvantaged for admission and financial support.

**LEARNING OUTCOMES**

**KNOWLEDGE AND SKILLS**

- Demonstrate an understanding of the basic biology of microorganisms that are symbiotic with plants including fungi, bacteria, viruses, oomycetes, and nematodes.
- Demonstrate a basic understanding of: a. the basic processes of pathogenesis, plant defense, and defense circumvention at the molecular, genetic and physiological level for each of the major groups of plant pathogens and other plant associated microorganisms. b. the etiology, ecology, and epidemiology of economically significant diseases caused by the major groups of plant pathogens and be able to apply the understanding from a. and/or b. above in research.
- Conduct project related to the discipline of Plant Pathology that requires specifying a problem, designing and conducting experiments, analyzing the resulting data, and reporting results/solutions.

**PROFESSIONAL CONDUCT**

- Convey scientific knowledge to fellow scientists in a variety of formats

**PEOPLE**

Faculty: Professors McManus (chair), Ahlquist, Allen, Bent, Charkowski, Clayton, Havey, Jiang, Keppler, Keller, MacGuidwin, Rouse, Yu; Associate Professors Ane, Barak, Gevens, Groves, Jansky; Assistant Professors Kabbage, Koch, Lankau, Rakotondrafara, Silva, Smith