PhD in Plant, Insect and Microbial Sciences

Degree Requirements

To satisfy the course requirements for a doctoral degree, a student must complete:

- A minimum of 72 credit hours from courses numbered 7000-9000 (this includes dissertation research credit hours - i.e. PLNT_SCI 9090).
- 15 credit hours (towards the 72 hour requirement) must be from courses numbered at the 8000 or 9000 level, exclusive of dissertation research, problems or independent study.
- For the Horticulture Program Area, all Doctoral students will have successfully completed the requirements for a master’s degree before beginning a doctoral program and no more than 30 hours of dissertation research may be counted towards the 72 hr minimum.
- Two semesters of PLNT_SCI 9087.
- Three semesters of PLNT_SCI 7087.

Crop, Soil and Pest Management

Core Requirements:
- PLNT_SCI 8010 Professionalism and Ethics 2
- PLNT_SCI 9087 Seminar in Plant Science (must enroll twice) 1
- PLNT_SCI 7087 Seminar (must enroll three times) 1
- PLNT_SCI 9090 Dissertation Research 1-10

Entomology

Core Requirements:
- PLNT_SCI 7710 Systematic Entomology 5
- PLNT_SCI 7820 Principles of Insect Physiology 4
- PLNT_SCI 8010 Professionalism and Ethics 2
- PLNT_SCI 9087 Seminar in Plant Science (must enroll twice. Only 1 credit will count towards the 15 credit hour at 8000/9000-level requirement.) 1
- PLNT_SCI 7087 Seminar (must enroll three times) 1
- PLNT_SCI 9090 Dissertation Research 1-10
- PLNT_SCI 9810 Insect Ecology 3

Horticulture

Core Requirements:
- PLNT_SCI 8010 Professionalism and Ethics 2
- PLNT_SCI 9087 Seminar in Plant Science (must enroll twice. Only 1 credit will count towards the 15 credit hour at 8000/9000-level requirement.) 1
- PLNT_SCI 7087 Seminar (must enroll three times) 1
- PLNT_SCI 9090 Dissertation Research 1-10

Plant Breeding, Genetics, and Genomics

Core Requirements:
- PLNT_SCI 8010 Professionalism and Ethics 2
- PLNT_SCI 9087 Seminar in Plant Science (must enroll twice. Only 1 credit will count towards the 15 credit hour at 8000/9000-level requirement.) 1
- PLNT_SCI 7087 Seminar (must enroll three times) 1
- PLNT_SCI 9090 Dissertation Research 1-10

Elective Courses to Fulfill the Requirement for 15 Credit Hours at 8000 or 9000 Level

- AN_SCI 8430 Introduction to Bioinformatics Programming 4
- BIO_SC 8300 Advanced Plant Genetics 3
- BIO_SC 8310 Fungal Genetics and Biology 3
- PLNT_SCI 8330 Molecular Breeding and Genomic Technology 3
- PLNT_SCI 8362 Introduction to Plant Metabolism 2
- PLNT_SCI 8365 Introduction to Molecular Cell Biology 2
- PLNT_SCI 9415 Advanced Plant Physiology 1-3
- PLNT_SCI 9540 Genetics of Plant-Microorganism Interaction 3
- PLNT_SCI 9810 Insect Ecology 3

Dissertation Research

Seminar in Plant Science (must enroll three times) 1
PLNT_SCI 9090 Dissertation Research 1-10
PLNT_SCI 7965 Readings in Plant Stress Biology (must take one of two courses each year.) 1-9
PLNT_SCI 7970 Readings in Plant-Insect Interactions 1

Electives

Bridging Courses to Expand Your Background in Plant Biology

- PLNT_SCI 7315 Crop Physiology 3
- PLNT_SCI 7320 Molecular Plant Physiology 3
- PLNT_SCI 7325 Advanced Plant Breeding 3
- PLNT_SCI 7500 Biology and Pathogenesis of Plant-Associated Microbes 4
- PLNT_SCI 7550 Plant Biotechnology 4

Elective Courses to Fulfill the Requirement for 15 Credit Hours at 8000 or 9000 Level

- AN_SCI 8430 Introduction to Bioinformatics Programming 4
- BIO_SC 8300 Advanced Plant Genetics 3
- BIO_SC 8310 Fungal Genetics and Biology 3
- PLNT_SCI 8330 Molecular Breeding and Genomic Technology 3
- PLNT_SCI 8362 Introduction to Plant Metabolism 2
- PLNT_SCI 8365 Introduction to Molecular Cell Biology 2
- PLNT_SCI 9415 Advanced Plant Physiology 1-3
A student will be considered to have passed the Qualifying Exam if all members, or all but one, of the Advisory Committee vote affirmatively. A student failing the Qualifying Exam will be given a second opportunity to pass. However, a student who fails the second exam shall terminate his/her course of study in the division not later than the end of the semester in which the examination was failed.

**Comprehensive Examination Process**

The Comprehensive Examination is a major milestone in the Ph.D. candidate’s progress towards completion of the degree requirements. The candidate is expected to clearly demonstrate his/her knowledge and understanding of the principles and concepts of the chosen Graduate Program Area, related biological sciences, and the scientific method. The Comprehensive Exam should be scheduled when the student has essentially completed the required plan of study. The Comprehensive Exam must be completed at least seven months before the final examination (defense). The Comprehensive Exam Committee is the same as the Doctoral Committee.

The Comprehensive Exam requires both written and oral performance by the student to achieve candidacy. The student’s advisor will select either Track I or Track II for the format of the exam. The student arranges the written and oral portion of the Comprehensive Exam with each member of the Committee.

**Dissertation Defense**

A dissertation is required of every Ph.D. Candidate in the Division of Plant Sciences. This is to be a substantial scholarly manuscript of original research conducted by the student. The dissertation should reflect the depth of understanding, independent thought, and original work worthy of a Ph.D.

The Dissertation Defense consists of a research seminar and final examination. It is the student's responsibility to check the Graduate School's graduation deadlines when scheduling the exam. The seminar will be presented by the student for division faculty, staff, students, committee members, and other interested persons. The student may choose to present the seminar as part of the Division Seminar Series. It must summarize the dissertation research conducted by the student during the Doctoral program. The seminar will be followed by the final, oral examination administered by the Doctoral Committee. Although the general protocol followed during the oral examination shall be at the discretion of the Major Advisor, a typical oral examination lasts about 2 hours and is divided between discussion of the dissertation and related, dissertation subject matter. The research seminar should be scheduled the same day (preferably) or during the week preceding the remainder of the final examination.

**Admissions**

Applicants are required to meet two sets of minimum qualifications for admission: the requirements of the PhD in Plant, Insect, and Microbial Sciences (https://gradschool.missouri.edu/degreecategory/plant-insect-microbial-sciences/) and the minimum requirements of the Graduate School (https://gradschool.missouri.edu/admissions/eligibility-process/). Because requirements vary, you must refer to a degree program’s graduate admission page to learn about specific admission criteria, application deadlines, eligibility and application process. Your application materials will be reviewed by both the Graduate School and the degree program to which you’ve applied before official admission to the University of Missouri.

**Financial Aid from the Program**

Financial assistance is available to qualified students at both the MS and PhD levels, as either fellowships or research assistantships. Some
programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website (http://plantsci.missouri.edu/graduate/) or ask the program contact for details.