MS in Plant, Insect and Microbial Sciences

Degree Requirements

To satisfy the course requirements for a master's degree, a student must complete:

- A minimum of 30 credit hours from courses numbered 7000 - 9000
- 15 credit hours (towards the 30 credit hour requirement) must be from courses numbered at the 8000 or 9000 level
- 12 credit hours (towards the 30 credit hour requirement) can be satisfied by research, readings and problems courses
- For the Horticulture Program Area, at least 6 credits must be from formal courses, excluding Problems and other independent study courses and only 6 credit hours of research (PLNT_S 8090) can count towards the 30 credit hour requirement, even though additional hours of research can be taken.

The division-wide course requirements for the master's degree are:

• PLNT_S 8010 Professionalism and Ethics
• PLNT_S 9087 Seminar in Plant Science
• PLNT_S 7087 Seminar (must enroll twice)
• PLNT_S 8090 Thesis Research (1 - 10 credits per semester)

Teaching Requirement

With the exception of the Entomology Program Area, all students must participate in an approved teaching opportunity or an approved extension program.

Satisfactory Rate of Progress

A student shall maintain a minimum grade point average of 3.0. All divisional course requirements (and any additional requirements set by the student’s examination committee) shall be completed in a timely manner. All advisors will meet annually with each of their graduate advisees. They will discuss the student’s performance, any problems that exist and any suggestions for improvement. The advisor will provide the student and the director of graduate studies with a written summary of the meeting as part of the annual program assessment process.

Sample Plan of Study

There are several areas of study within the MS in Plant, Insect and Microbial Sciences degree. A student can select training from a wide range of courses and research programs to prepare for a career in research, teaching, industry and extension work. Note: Areas of Study will not appear on transcripts or diplomas. Each program area emphasizes a customized approach towards the course of study. Each student will work with their advisor and graduate committee to develop a course of study best suited to the student’s educational and career goals.

Crop, Soil and Pest Management

Core Requirements:

PLNT_S 8010 Professionalism and Ethics 2
PLNT_S 9087 Seminar in Plant Science 1
PLNT_S 7087 Seminar (must enroll twice) 2

Elective Courses

Bridging Courses to Expand Your Background in Plant Biology
PLNT_S 7315 Crop Physiology 3
PLNT_S 7320 Molecular Plant Physiology 3
PLNT_S 7500 Biology and Pathogenesis of Plant-Associated Microbes 4

Elective Courses to Fulfill the Requirement for 15 Credit Hours at the 8000 or 9000 Level
AN_SCI 8430 Introduction to Bioinformatics Programming 4
BIO_SC 8310 Fungal Genetics and Biology 3
PLNT_S 8330 Molecular Breeding 3
PLNT_S 8362 Introduction to Plant Metabolism 2
PLNT_S 8365 Introduction to Molecular Cell Biology 2
PLNT_S 8650 Ecological and Evolutionary Genomics 2
PLNT_S 9415 Advanced Plant Physiology 3
PLNT_S 9440 Applied Quantitative and Statistical Genetics 3
PLNT_S 9540 Genetics of Plant-Microorganism Interaction 3
PLNT_S 9810 Insect Ecology 3

Entomology

Core Requirements:

PLNT_S 7710 Systematic Entomology 5
PLNT_S 7820 Principles of Insect Physiology 4
PLNT_S 8010 Professionalism and Ethics 2
PLNT_S 9087 Seminar in Plant Science 1
PLNT_S 7087 Seminar (must enroll twice) 2
PLNT_S 8090 Thesis Research 1-10 per semester
PLNT_S 9810 Insect Ecology 3

One Elective formal Entomology course

Horticulture

Core Requirements:

PLNT_S 8010 Professionalism and Ethics 2
PLNT_S 9087 Seminar in Plant Science 1
PLNT_S 7087 Seminar (must take twice) 2
PLNT_S 8090 Thesis Research 1-9 per semester

Plant Breeding, Genetics and Genomics

Core Requirements:

PLNT_S 8010 Professionalism and Ethics 2
PLNT_S 9087 Seminar in Plant Science 1
PLNT_S 7087 Seminar (must take twice) 2
PLNT_S 8090 Thesis Research 1-10 per semester

Elective Courses

Bridging Courses to Expand Your Background in Plant Biology
PLNT_S 7315 Crop Physiology 3
PLNT_S 7320 Molecular Plant Physiology 3
PLNT_S 7500 Biology and Pathogenesis of Plant-Associated Microbes 4

Elective Courses to Fulfill the Requirement for 15 Credit Hours at the 8000 or 9000 Level
AN_SCI 8430 Introduction to Bioinformatics Programming 4
BIO_SC 8310 Fungal Genetics and Biology 3
PLNT_S 8330 Molecular Breeding 3
PLNT_S 8362 Introduction to Plant Metabolism 2
PLNT_S 8365 Introduction to Molecular Cell Biology 2
PLNT_S 8650 Ecological and Evolutionary Genomics 2
PLNT_S 9415 Advanced Plant Physiology 3
PLNT_S 9440 Applied Quantitative and Statistical Genetics 3
PLNT_S 9540 Genetics of Plant-Microorganism Interaction 3
PLNT_S 9810 Insect Ecology 3

Plant Stress Biology

Core Requirements:

Choose one course:
PLNT_S 7315 Crop Physiology
PLNT_S 7320 Molecular Plant Physiology

Choose one course:
**Admissions**

Admission Contact Information  
Ms. Chrisita Smith  
52 Agriculture Lab; Columbia, MO 65211  
(573) 882-3001

Applicants are required to meet two sets of minimum qualifications for admission: the requirements of the MS in Plant, Insect, and Microbial Sciences (http://gradstudies.missouri.edu/academics/programs/plant-insect-microbial-sciences/masters.php) and the minimum requirements of the Office of Graduate Studies (http://gradstudies.missouri.edu/admissions/eligibility-process/minimum-requirements). 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 Office of Graduate Studies 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.

---

**MS in Plant, Insect and Microbial Sciences**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLNT_S 7500</td>
<td>Biology and Pathogenesis of Plant-Associated Microbes</td>
<td></td>
</tr>
<tr>
<td>PLNT_S 8505</td>
<td>Introduction to Plant Stress Biology</td>
<td></td>
</tr>
</tbody>
</table>

**Additional Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLNT_S 8010</td>
<td>Professionalism and Ethics</td>
<td>2</td>
</tr>
<tr>
<td>PLNT_S 8530</td>
<td>Research with Plant Stress Agents</td>
<td>3</td>
</tr>
<tr>
<td>PLNT_S 9087</td>
<td>Seminar in Plant Science</td>
<td>1</td>
</tr>
<tr>
<td>PLNT_S 7087</td>
<td>Seminar (must enroll twice)</td>
<td>2</td>
</tr>
<tr>
<td>PLNT_S 8090</td>
<td>Thesis Research</td>
<td>1-10 per semester</td>
</tr>
</tbody>
</table>

**Participation In One of Two Readings Courses Each Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLNT_S 7965</td>
<td>Readings in Plant Stress Biology</td>
<td>1</td>
</tr>
<tr>
<td>PLNT_S 7970</td>
<td>Readings in Molecular Ecology of Herbivory</td>
<td>1</td>
</tr>
</tbody>
</table>

**Elective Courses to Fulfill the 30 Credit Hour Minimum**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN_SCI 8430</td>
<td>Introduction to Bioinformatics Programming</td>
<td>4</td>
</tr>
<tr>
<td>BIO_SC 8300</td>
<td>Advanced Plant Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BIOCHM 8434</td>
<td>Signaling in Molecular Cell Biology</td>
<td>3</td>
</tr>
<tr>
<td>INFOINST 8005</td>
<td>Applications of Bioinformatics Tools in Biological Research</td>
<td>3</td>
</tr>
<tr>
<td>BIO_SC 8310</td>
<td>Fungal Genetics and Biology</td>
<td>3</td>
</tr>
<tr>
<td>PLNT_S 8330</td>
<td>Molecular Breeding</td>
<td>3</td>
</tr>
<tr>
<td>PLNT_S 8362</td>
<td>Introduction to Plant Metabolism</td>
<td>2</td>
</tr>
<tr>
<td>PLNT_S 8365</td>
<td>Introduction to Molecular Cell Biology</td>
<td>2</td>
</tr>
<tr>
<td>PLNT_S 9415</td>
<td>Advanced Plant Physiology</td>
<td>1-3</td>
</tr>
<tr>
<td>PLNT_S 9440</td>
<td>Applied Quantitative and Statistical Genetics</td>
<td>3</td>
</tr>
<tr>
<td>PLNT_S 9540</td>
<td>Genetics of Plant-Microorganism Interaction</td>
<td>3</td>
</tr>
<tr>
<td>PLNT_S 9810</td>
<td>Insect Ecology</td>
<td>3</td>
</tr>
</tbody>
</table>

**Additional Entry Level Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLNT_S 7550</td>
<td>Plant Biotechnology</td>
<td>4</td>
</tr>
<tr>
<td>PLNT_S 7400</td>
<td>Plant Anatomy</td>
<td>4</td>
</tr>
<tr>
<td>STAT 7070</td>
<td>Statistical Methods for Research</td>
<td>3</td>
</tr>
</tbody>
</table>

**Thesis Requirements**

A thesis is required for the M.S. degree in Plant, Insect and Microbial Sciences. The thesis must demonstrate the student’s capacity for research and independent thought. Organization of the thesis is subject to approval of the Master’s Committee.

The Thesis Defense will consist of a research seminar and final examination, the latter to demonstrate the student’s mastery of the academic focus of the chosen Graduate Program Area. It is the student’s responsibility to check the Graduate Studies Office’s graduation deadlines when scheduling the exam. The candidate must be enrolled to defend the thesis. The examination cannot be administered when MU is not officially in session.

The seminar will be presented by the student for division faculty, staff, students, committee members, and other interested persons. It must summarize the thesis research conducted by the student during the Master’s program. The seminar will be followed by the final, oral examination administered by the Master’s 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 defense of the thesis and non-thesis subject matter. The research seminar should be scheduled the same day (preferably) or during the week preceding the remainder of the final examination.