

APPLIED AND AGRICULTURAL BIOLOGY - DOCTOR OF PHILOSOPHY

Program Requirements

Prefix	Title	Credits
EPWS 525	Advanced Scientific Writing	3
or EPWS 613	Introduction to Scientific Writing	
EPWS 613	Introduction to Scientific Writing	3
or EPWS 525	Advanced Scientific Writing	
EPWS 690	Doctoral Seminar	1
EPWS 6991	Doctoral Research (maximum of 6 count toward degree)	3
EPWS 7000	Doctoral Dissertation	1-15
BIOL 540	Science and Ethics	3
Students will take at least 12 credits from the following		12
EPWS 525	Advanced Scientific Writing	
or EPWS 613	Introduction to Scientific Writing	
EPWS 640	Tropical Insect Ecology	
EPWS 660	Ecology and Management of Invasive Plant Species	
EPWS 662	Parasitology	
EPWS 675	Urban Entomology	
EPWS 6996	Advanced Topics	
Students are required to take at least 6 credits from the following:		6
A ST 503	SAS Basics	
A ST 504	Statistical Software Applications	
A ST 505	Statistical Inference I	
A ST 506	Statistical Inference II	
A ST 509	Statistical Models for Complex Data Structures	
A ST 511	Statistical Methods for Data Analytics	
A ST 515	Statistical Analysis with R	
A ST 540	Predictive Analytics	
BIOL 562	Advanced Genomics Technology	
BIOL 566	Advanced Bioinformatics and NCBI Database	
CSCI 4140	Database Management Systems I	
PLEN 6425	Biometrical Genetics and Plant Breeding	
PLEN 6610	Introduction to Environmental and Ecological Modeling	
<i>Courses, including special topics, can be substituted with advisor's approval. Additionally, new approved graduate level courses may be submitted with advisor's approval. Students can take a combination of the following to complete their degree:</i>		
AGRO 516	Molecular Analysis of Complex Traits	
PLEN 6110	Arid Land Water Resources	
PLEN 6120	Instrumentation in Agronomy	
PLEN 6320	Advanced Soil Physics	
PLEN 6415	Breeding for Plant Disease Resistance	
PLEN 6420	Advanced Crop Breeding	
ANSC 602	Advanced Reproductive Physiology	
ANSC 621	Metabolic Functions and Dysfunctions	
BCHE 546	Biochemistry II: Central and Intermediary Metabolism	
BCHE 647	Physical Biochemistry	
BIOL 527	Symbiosis	

BIOL 536	Advanced Disease Vector Biology	
BIOL 568	Communities and Ecosystems	
BIOL 582	Advanced Plant Signalling and Development	
BIOL 587	Behavioral and Evolutionary Ecology	
GEOG 542	Programming for GIS	
GEOG 552	Landscape Ecology	
GEOG 573	Introduction to Remote Sensing	
GEOG 578	Fundamentals of GIS	
GEOG 585	Spatial Analysis and Modeling	
MOLB 520	Molecular Cell Biology	
MOLB 545	Molecular and Biochemical Genetics	
MOLB 542	Biochemistry I	
RGSC 509	Approaches to Rangeland Research	
RGSC 513	Advanced Rangeland Ecology	
RGSC 516	Arid Land Management	
RGSC 518	Watershed Methods and Management	
RGSC 520	Arid Land Plant Herbivore Interactions	
RGSC 575	Climate Studies, Water and Society	
<i>Additional Coursework for students with only a B.S. degree:</i>		
EPWS 511	Introduction to Weed Science (f)	4
EPWS 502	General Entomology	4
EPWS 551	Special Topics	1-4
EPWS 505	Advanced Integrated Pest Management	3
EPWS 551	Special Topics	1-4
Additional 3 credits from experimental design/statistical analyses.		3

Candidates are accepted into the department to work with a specific faculty member that serves as their major advisor and committee chair. They will develop a dissertation committee in collaboration with their advisor that includes at least two other members of the graduate faculty, at least one of which must be from the same department, and a Dean's representative who must come from outside the department. The committee should be established during the second semester of study.

Students will select classes with the help of their major advisor based on background and interests. Students with a M.S. degree are expected to complete their degree in 3-4 years, but may be allowed up to 7 years to complete the requirements if they begin with a B.S.

For students with a M.S. degree, a minimum of 30 credits of graduate course work plus 18 credits of dissertation (7000) is required to graduate. This is 48 credits to graduate. Students with a B.S. degree must have at least an additional 12 credits, for a total of 60 credits beyond the B.S. degree.

Ph.D. students must do the following:

- Complete a minimum of 6 semesters, with at least two occurring after the comprehensive exam.
- Complete a minimum of 30 credits of graduate work plus 18 credits of dissertation (EPWS 7000 Doctoral Dissertation).
- At least 15 credits must be in courses numbered 500 or above.
- At least 15 credits must be from the EPWS program.
- No more than 6 credits of EPWS 6991 Doctoral Research may apply toward graduation.
- At least 3 credits of EPWS 690 Doctoral Seminar.

- Complete a minimum of 9 hours of course work numbered above 600, exclusive of research and dissertation credit.
- Maintain a minimum grade point average of 3.0.
- Complete the degree within 7 years of admission.
- Enroll in at least 1 credit/semester or 9 credits if full time.
 - Full time students may petition to enroll for only 1 credit during their final semester if all other credit requirements have been fulfilled.
- Enroll in seminar classes and present at least 3 seminars.
- Complete annual Student Progress Report.
- Successfully complete a qualifying exam, comprehensive exam, and dissertation defense. (see below)

Ph.D. candidates are recommended to do the following:

- Gain experience as a teaching assistant for at least two semesters.
- Present research at least once in a poster or oral format at a regional, national, or international conference.
- Submit at least one manuscript as first author for publication in a peer-reviewed journal.

Exams

Qualifying exam – Students with a M.S. degree will take the qualifying exam at the end of the first year and after completion of at least 12 course credits. Students with a B.S. degree will take the qualifying exam at the end of the second year and after completion of at least 18 course credits. The qualifying exam will consist of a short proposal or a list of curated questions, and an oral exam in coordination with the students committee. There will be no additional qualifying exam requirements for students with B.S. degrees. If a student does not pass the qualifying exam, they will have the opportunity to continue their research and pursue a M.S. degree. For M.S. degree holding students, note options below.

Comprehensive exam – This exam covers all phases of the major and minor fields of study and is given after completion of the agreed-upon course work, and when sufficient progress has been made toward fulfilling agreed upon research goals. The examination must contain both written and oral portions. The written portion may be in the form of a proposal or it may consist of questions presented by individual committee members. The student must satisfy the graduate committee's expectation on the written portion before moving on to the oral portion. If a student does not meet the committee's expectation on the written or oral portion, they may be required to re-take a portion or the entire exam. Students must pass the examination within 36 months of passing the qualifying exam and may not register for 7000 level courses until both parts of the comprehensive have been passed. If a student does not pass the comprehensive exam, they will have the opportunity to continue their research and pursue a M.S. degree. For M.S. degree holding students note options below.

Final dissertation defense – this is taken after completing all other degree requirements. The student will complete 18 credits of doctoral dissertation prior to the defense. There is a minimum of one year between the comprehensive exam and the defense. If a student does not pass the final defense, they may be given the opportunity to convert their

dissertation into a thesis and pursue a M.S. degree. For M.S. degree holding students note options below.

Note that for each of the exam stages (i.e., qualifying exam, comprehensive exam, and dissertation defense), when an M.S degree holding student does not pass they may not be allowed to continue in the program. Such a case will be dealt with on an individual basis with active participation from the graduate dean.

Students should consult the Graduate School website for specific information regarding the completion of the degree and submission of the dissertation.