

# AGRICULTURAL SCIENCES (PH.D.)

<https://colsa.unh.edu/agriculture-nutrition-food-systems/program/phd/agricultural-sciences>

## Description

The Doctor of Philosophy (Ph.D.) in Agricultural Sciences graduate program offered by the Department of Agriculture, Nutrition, and Food Systems (ANFS) offers a flexible course of study that provides education and research experience plant and animal agriculture, aquaculture, food systems, and related fields. As a graduate student in ANFS, you will be engaged in an interdisciplinary department focusing on the farm to fork wellness continuum and a holistic approach to solving problems. You will also develop independent and team research experience.

As an Agricultural Sciences student, you will have the opportunity to optimize your graduate course work to suit your interests and career goals. Our faculty offer education and research opportunities in the diverse components of plant and animal agricultural systems including breeding and genetics, physiology, environmental interactions, organismal health, agroecology, and pathology. Student are exposed to diverse production systems, including field based, hydroponics, and aquaculture, as well as post-harvest practices. Beyond the classroom and the lab, you will hone communication skills that essential for professional scientists through teaching, extension, and outreach opportunities with stakeholders and constituents.

With a Ph.D. in Agricultural Sciences, students are prepared to pursue careers in college teaching and research positions in industry and government. Students may work in plant and animal agriculture, aquaculture, food production and distribution systems, teaching, public service, research in federal, state, and private organizations, or related fields.

The Ph.D. program is thesis-based, with the expectation of generating and publishing substantial new knowledge in the field of interest.

## Requirements

Doctor of Philosophy (Ph.D.) graduate students work with their advisor and Doctoral Guidance Committee to plan a program of study including the required core courses, competencies, and develop a research proposal. To complete the degree, students must complete a research proposal, pass a qualifying exam, conduct dissertation research, and complete and defend a dissertation.

**Guidance and Dissertation Committees:** During the first semester, the student and advisor jointly select members of a guidance committee. A nomination form must be sent to the graduate school to officially appoint the committee membership. The Guidance Committee consists of 5 members and is responsible for approving the proposal and oversees the qualifying examination. Once the student has advanced to candidacy, the Doctoral Dissertation Committee is formed. The Dissertation Committee is responsible for administering the dissertation exam.

**Dissertation Proposal and defense:** All Ph.D. students are required to develop a formally approved research proposal typically by the end of the third semester and no later than the fourth semester. Proposals

are approved by the dissertation committee and the major advisor. In addition to the written proposal, students are expected to present a proposal defense presentation. This proposal should consist of the following:

1. comprehensive review of the literature related to the student's research topic.
2. statement of need/justification.
3. research goal with a list of research objectives with stated hypotheses that address the major research questions.
4. plan of work describing the experimental approaches or methods to be used in answering the thesis questions.
5. Expected outcomes and potential pitfalls for each objective.
6. Timeline for completion of the work.
7. preliminary research where appropriate.

**Candidacy:** Following approval of the research proposal and completion of coursework, doctoral students should advance to candidacy. Candidacy is reached after passing a formal qualifying examination that assesses both broad basic knowledge of the student's field, and topics central to the research project. The purpose of the exam is to measure of the student's likelihood of successfully completing a doctoral program. The qualifying exam comprises written and oral components.

1. Written exam: Student choose three areas of specialization in consultation with their Doctoral Guidance Committee. The advisor solicits questions from Committee members and administers the exam. Once completed, Committee members evaluate the responses. The student is expected to demonstrate competence in each of the chosen areas, reflected in clear, concise, well-organized synthetic essays. The exam may be "closed book" or "open book" at the discretion of the advisor.
2. Oral exam: An oral exam is conducted by the Doctoral Guidance Committee and chaired by the advisor. The student should demonstrate mastery of fundamental concepts in the designated areas of specialization, draw upon a broad spectrum of information to answer theoretical and practical questions. There may be focus on any area that was deemed weak in the written exam.

When the student has passed both parts of the qualifying exam, the advisor will inform the Graduate School and recommend that the student be advanced to candidacy in the Ph.D. degree program.

**Dissertation and oral defense:** All students must complete a dissertation reporting original research. After completion of the research, the candidate must provide a copy of the dissertation to the Doctoral Dissertation committee at least two weeks prior to the final oral examination. The final thesis defense consists of two parts: an oral presentation of the research in a public seminar, and an oral defense of the dissertation conducted by the Doctoral Dissertation Committee. Final approval of the dissertation will be determined by a majority vote of the committee.

### Number of Credits Required

There is no specific credit requirement for the Ph.D., though students must take the required core courses and fulfill the competences outlined below. Up to 8 credits of graduate credit from another institution may be transferred, provided the credits were not counted toward another degree, and the course grade was a B or higher. Petitions requesting transfer credit must be supported by the advisor and graduate committee and approved by the UNH Graduate School.

## 2 Agricultural Sciences (Ph.D.)

Code	Title	Credits
<b>Core Course Requirements</b>		
ANFS 901	Introduction to Agriculture, Nutrition, and Food Systems Graduate Studies <sup>1</sup>	1
ANFS 997	Agriculture, Nutrition, and Food Systems Seminar <sup>2</sup>	1
<b>Competency Requirements <sup>3</sup></b>		
In addition, students will be expected to demonstrate competency in areas of experimental design and analysis and scientific writing and communication. Supportive course offerings include:		
BIOL 902	Writing and Publishing Science	2
ANFS 933	Design, Analysis, and Interpretation of Experiments	4

<sup>1</sup> To be taken at the earliest opportunity: typically, in the initial fall semester of the graduate program.

<sup>2</sup> All students are required to register and participate in ANFS 997 (1 credit Pass/Fail) for a minimum of 4 credits.

<sup>3</sup> Depending on the student, one or both of these competency requirements may have been fulfilled through previous graduate studies, other course work, or professional experience as approved by the committee and ANFS graduate coordinator.

Each student, in consultation with their graduate committee, will define one or more areas of informal specialization, and will take additional courses appropriate for their area(s) of specialization.

### Additional Information/Requirements

All students in the Agricultural Sciences Ph.D. Program are expected to present their research in ANFS departmental seminar at least three times (including the defense seminar). Students are also encouraged to present at professional conferences and acquire teaching and/or mentoring experience.

### Annual evaluation

The annual evaluation of graduate students ensures that students receive the mentorship they deserve and are making progress toward completion of their degrees. The annual evaluation of graduate students consists of a collaborative effort between faculty adviser and student to:

- Complete a self-assessment;
- Present a professional quality CV suitable for awards, job applications, and internships;
- Produce a narrative of service or other activities not captured on a CV;
- Develop annual goals.