



UNIVERSITY OF MINNESOTA

***Animal Sciences
Graduate Program***

Graduate Student Handbook 2016

The University of Minnesota shall provide equal access to and opportunity in its programs, facilities, and employment without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression.

Inquiries regarding compliance may be directed to the Director, Office of Equal Opportunity and Affirmative Action, University of Minnesota, 274 McNamara Alumni Center, 200 Oak Street S.E., Minneapolis, MN 55455, (612) 624-9547, eoaa@umn.edu. Website at: diversity.umn.edu/eoaa.

This publication/material is available in alternative formats upon request. Please contact Department of Animal Science office at **612-624-3491** or berth034@umn.edu.

Welcome to the Animal Sciences Program

Information in this handbook applies to all students admitted for study in the Animal Sciences Graduate Program. This manual supplements information provided online. Additional useful information can be found in the online *University of Minnesota Graduate School Catalog* (<http://www.catalogs.umn.edu/grad/index.html>) and the *Graduate Assistants Employment website* (<http://www1.umn.edu/ohr/gae/>). The Graduate Assistant Employment office also offers information, help, and troubleshooting for matters pertaining to research and teaching assistants. You should be familiar with these sources of information and use this manual for subjects specific to Animal Sciences.

During your residence in our program, you should remain in contact with the Program Office about all of their deadlines. In addition, the Graduate School should be consulted regarding such matters as transfer of credits, tuition, fees, residency requirements, thesis credit requirements, and taxes on assistantships.

This handbook was updated September 2016.

The information in this handbook and other University catalogs, publications, or announcements is subject to change without notice. University offices can provide current information about possible changes.

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Animal Sciences Program

Animal Sciences Mission Statement

We enhance the productivity and well-being of animals to support a growing world population through education, science, and innovative technology.

Animal Sciences Teaching Mission Statement

We provide lifelong opportunities for people to learn about animal biology, management systems for domestic animals, and the role of animals in a changing society.

Animal Sciences Program Office

The Animal Sciences (AnSc) Graduate Program office in the Twin Cities is located on the St. Paul campus, in the Departmental of Animal Science Office at 305 Haecker Hall, 1364 Eckles Ave., St. Paul, MN 55108. There are also some faculty members who have offices and labs in AnSc/VetMed, and additional graduate student and lab assistant areas are there as well. Office hours are 8:00am-4:30pm.

Admission

Students should apply well in advance of the semester in which they wish to enter, but not more than one year before the proposed entry date. Applications for admission are accepted throughout the year, with cutoff dates for each term. The cutoff date for fall semester is April 15th and the cutoff date for spring semester is October 15th. Students are highly encouraged to schedule a campus visit and connect with faculty members before applying. If interested in scheduling a visit please contact: Allison Berth at berth034@umn.edu.

All applications are to be submitted on-line through the University of Minnesota Graduate School website:

https://app.applyyourself.com/AYApplicantLogin/fl_ApplicantConnectLogin.asp?id=UM N-GRAD.

The Graduate School catalog should be consulted regarding transfer of credits as some limitations exist.



The prerequisites for admission into the Animal Sciences Graduate Program are:

1. A baccalaureate degree or its international equivalent in agriculture, biology, or a closely related field. Applicants should have substantial training in chemistry, mathematics, physics, and statistics. A minimum baccalaureate grade point average of 3.0 is generally required for admission to the M.S. and Ph.D. programs in Animal Sciences. A minimum M.S. grade point average of 3.2 is generally required for admission to the Ph.D. program.
2. The Graduate Record Examination (GRE) is required. GRE test scores are used in conjunction with other admission material to assess the potential of the candidate to successfully complete a graduate program at the University of Minnesota. There is no minimum GRE score above which a student must score in order to be considered for admission to the Animal Sciences Graduate Program.
3. The Test of English as a Foreign Language (TOEFL) is a requirement of the Graduate School for all applicants whose native language is not English. A minimum score of 550 is required for admission to the Graduate School.
4. Three letters of recommendation.
5. A personal statement by the applicant describing objectives and goals.
6. If you have already identified and confirmed a faculty member who will serve as your advisor, please write a paragraph highlighting why you are interested in working with them.

OR

If you have not yet identified and confirmed a faculty member who will serve as your advisor, please select up to three faculty members that you are interested in working with. Write a paragraph for each faculty member highlighting why their research and work interests you, and what you hope to gain working with them specifically.

Applications for admission will be reviewed initially by the Graduate Program Director (GDP) and Director of Graduate Studies (DGS). If the applicant complies with the minimum requirements, the application will be distributed to faculty in the area(s) of emphasis indicated by the applicant.

A prospective student must have documented financial support in order to be accepted into the program. The support may be in the form of an assistantship, a sponsorship, employment, or family assistance. International students that do not receive a University of Minnesota stipend must have self-supporting funds for the first year,

followed by some indication of financial support (funding from a faculty member or some alternative source) for the balance of the graduate program.

Tuition and Financial Aid

Tuition and fees for full-time graduate students can be found at OneStop at: http://onestop.umn.edu/finances/costs_and_tuition/tuition_and_fees/graduate_school_tuition.html The Department of Animal Science offers full and partial research and teaching assistantships that cover tuition, fringe benefits, and stipend. These are funded through departmental funds as well as faculty funds. Students with a maximum research assistantship also receive a full-tuition waiver. Students with a partial research assistantship receive a partial-tuition waiver.

The Graduate School offers a limited number of Graduate School Fellowships for incoming students. Students nominated by the Animal Sciences program compete with nominees from other graduate programs for these prestigious awards. Additional information can be accessed through the Graduate School website: <http://www.grad.umn.edu/fundingtuition>

A limited amount of other scholarship money is available. For example, some Animal Sciences graduate students receive scholarships from member organizations of the National Feed Ingredients Association. Most of these awards are from \$500 to \$2000 and are for students already in Graduate School. However, a few scholarships from these several sources are available to new graduate students.

Students who are considered for research assistantships will automatically be considered for other awards for which they are eligible and will be sent the appropriate applications. To ensure consideration for all forms of financial assistance, applications for research assistantships should be received no later than January 15th for admittance during the following academic year. Applications for most other awards are due from late January to late spring.

Rising Scholar Award

The purpose of this award is to recruit students of high academic achievement, increase the number of students in the Animal Sciences graduate program, and support faculty members engaged in advising graduate students.

Students awarded a Rising Scholar Award are expected to teach at least one course per academic year. Up to two awards will be awarded per year. One will be awarded to an incoming student the fall semester, and one will be awarded to an incoming student the spring semester. If no award is given to a candidate in the spring semester, then the following fall semester the committee can opt to give two awards for the fall semester.

Eligibility

The Rising Scholar Award is intended for incoming graduate students pursuing a Master's or Ph.D. in Animal Sciences. Students are not eligible for this assistantship if they are already a graduate student within the Department of Animal Science. Faculty advisors may nominate up to one student. Students must have submitted all of their graduate program application materials or must have been accepted at the time of application to be eligible for the fellowship. Students are ineligible for a second award.

Amount

Two-thirds of a research assistantship will be covered by the department each year for up to two years for a Master's student and up to three years for a Ph.D. student. The faculty member is expected to contribute with the remaining third of the assistantship each year.

Nomination Materials

1. **Faculty Nominating Letter** - The faculty member should attach a nominating letter describing the nominated student's academic merits, the faculty's ability to fund one-third of the assistantship, and evidence of how the faculty member has supported graduate student recruitment and learning and their plans to support these efforts in the future.
2. **Nominee's Teaching Statement** - One to two paragraph statements about what the nominee hopes to achieve as a teaching assistant within the Department of Animal Science.
3. **Nominee's Personal Statement from Graduate Program Application**
4. **Nominee's Transcripts**
5. **Nominee's Letters of Recommendation from Graduate Program Application**

Selection Criteria

The review and selection will be conducted by Graduate Studies Committee, which will select the awardees based on the following criteria (not listed in order of importance):

- The strength of the academic record and the overall professional promise.
- Demonstrated commitment of faculty member to graduate student learning.
- Letters of recommendation.
- Nominee's personal statement.

Application and Notification Timeline

Applications must be submitted by April 15th to be eligible for award for the following fall semester. DGS will notify faculty advisor and prospective student by May 1st. Applications must be submitted by October 15th to be eligible for award for following spring semester. DGS will notify faculty advisor and prospective student by November 1st.

Award Policy

Recipients may not concurrently hold a second fellowship, scholarship, grant, or similar award that duplicates the benefits of the assistantship

Animal Sciences Administration

Marshall Stern

Director of Graduate Studies (DGS)
180A Haecker Hall
Phone: (612) 624-9296
E-mail: stern002@umn.edu

Allison Berth

Graduate Program Coordinator (GPC)
305 Haecker Hall
Phone: (612) 624-3491
E-mail: berth034@umn.edu

Lisa Wiley

Graduate Student Services
277 Coffey Hall
Phone: (612) 624-2748
E-mail: lwiley@umn.edu

Director of Graduate Studies

The Graduate School recognizes one Director of Graduate Studies (DGS) and requires that all forms be signed by the DGS. Thus, forms or other activities requiring formal DGS approval must be routed through the AnSc office in St. Paul. The DGS will also oversee ethics requirements, course availability, seminars, and other AnSc activities. The DGS is appointed for a three-year term by the Department Head based on recommendations from the Graduate Faculty. This term can be extended if agreed upon by the Department Head and DGS.

Graduate Program Coordinator

The Graduate Program Coordinator (GPC) supports the DGS, Graduate Studies Committee, and graduate students. The GPC is responsible for maintaining program materials, supporting administrative tasks, advising graduate students on policies and procedures, and communicating program updates and changes to AnSc faculty, graduate students, and staff.

Animal Sciences Graduate Studies Committee

The Animal Sciences Graduate Program is administered by the Director of Graduate Studies and the Graduate Studies Committee. The Graduate Studies Committee has a

membership of seven: the Director of Graduate Studies, one graduate faculty member elected by the graduate faculty within each of the four areas of emphasis (genetics, nutrition, physiology, and production systems), and two graduate students. Faculty representatives are elected for three-year terms with the option to renew or extend their term if agreed upon by the DGS and faculty member. Graduate students in the Animal Sciences program select representatives for lengths of terms to be determined by the graduate students. The purpose of this committee is to set policy, determine the direction of the program, and create exams with input from graduate faculty for the PhD written comprehensive exam.

Student Records

Records for all AnSc students are maintained in the AnSc office on the St. Paul campus. All of the forms (electronic and paper) used for degree progress are available on the Graduate School Web site link, "Forms for Current Students" (<http://www.grad.umn.edu/students/forms/>). These include:

Forms for Masters Students

Degree Progress:

- Assign/Update Advisor (GPC only)
- Graduate Degree Plan
- Assign/Update Examination Committee
 - Quick Start Guide
- Petition Form
- Time Extension Request Form
- Thesis Formatting and Submission

Special Purpose:

- Application for Advanced Master's Status
- Letter of Certification Request
- Deposit Agreement
- Signature Page
- Thesis or Dissertation Hold Request
- Leave of Absence (policy and forms)
- Graduate Minor Request

Forms for Doctoral Students

Degree Progress:

- Assign/Update Advisor (GPC only)
- Graduate Degree Plan
- Petition Form
- Time Extension Request Form
- Preliminary Examination Information
 - Record Preliminary Written Exam Results (program staff only)
 - Assign/Update Preliminary Oral Examination Committee
 - Quick Start Guide
 - Preliminary Oral Examination Scheduling

- Final Examination Information
 - Assign/Update Final Oral Examination Committee
 - Quick Start Guide
 - Final Oral Examination Scheduling
- Thesis Formatting and Submission

Special Purpose:

- Application for Advanced Doctoral Status (Departmental use only)
- Letter of Certification Request
- Thesis or Dissertation Hold Request
- Deposit Agreement
- Signature Page
- Leave of Absence (policy and forms)
- Graduate Minor Request

If you have questions about these forms, please contact the AnSc office.

Grievance Policy

Any grievance arising during graduate study should be resolved through consultation with your advisor. Should a matter not be resolved at this point, or should the issue be inappropriate for discussion with your advisor, you should consult with the DGS and Graduate Program Coordinator. For employment and departmental issues, consulting the head of the department may be more appropriate. If the DGS nor department head is able to resolve the grievance, then consult with the CFANS Graduate Programs Coordinator, Lisa Wiley, at lwiley@umn.edu or Student Conflict Resolution Center. (<http://www.sos.umn.edu/>). Best advising practices are found in Appendix I.

Council of Graduate Students

The Council of Graduate Students (COGS) represents all graduate students at the University. The role of COGS is to support graduate students by advocating, informing, and facilitating communication surrounding University administrative and policy decisions. The Animal Sciences Department is allowed one representative to serve on COGS. Other services provided by COGS include: the *Gradletter* (distributed at the beginning of the academic year), web links for graduate student resources, a Facebook graduate student exchange, as well as travel grants and professional development awards.

COGS Contact information:

Office: 202 Coffman Memorial Union

Mailing address: 303 Johnston Hall

101 Pleasant Street SE

Minneapolis, MN 55455

Phone: 612-625-2982

Web: www.cogs.umn.edu

Grad Student Exchange:

<https://www.facebook.com/groups/umn.grad.student.exchange/>

Animal Sciences Graduate Club

The Animal Sciences Graduate Club consists of current graduate students in the department and serves as a networking opportunity and a social environment among graduate students. The Graduate Club provides an opportunity for students to learn about research others are conducting and to create discussions about projects, experimental designs, or statistical analysis. Most importantly, it provides opportunities to socialize - whether it's a BBQ at lunch or a Twin's game after work. Graduate students also conduct tours of the animal barns on campus and coordinate Department of Animal Science clothing sales to generate funds for social activities. Animal Sciences graduate students are automatically a member of the club – no dues required.

Website: <https://www.ansci.umn.edu/undergraduate-program/student-organizations/animal-sciences-graduate-club>

Facebook: www.facebook.com/University-of-Minnesota-Animal-Sciences-Graduate-Club-649231011843244/timeline/

Safety and Training Requirements

Safety requirements, training, and rights and responsibilities for a safe workplace should be covered by your advisor or home department. Be advised that the University requires training for laboratory safety and hazardous waste, research involving human and animal subjects, and other topics. Check with your advisor or department for further details.

Activities

Graduate Program Seminar Series

The Graduate Seminar Series (ANSC 8510) is offered once a week on Monday afternoons from 3 to 4 PM in 365 Haecker Hall. Seminar speakers include faculty members, industry professionals, and graduate students. Seminars topics address a wide range of animal science related areas. A Graduate Seminar Committee consists of four faculty and four students. The committee is responsible for coordinating speakers and grading student presenters. All AnSc graduate students are expected to attend seminars, unless they have course or work-related conflicts. If a student has a conflict they may complete the course online, as all seminars are video recorded and posted online the following day. Check the following syllabus

(https://www.ansci.umn.edu/sites/ansci.umn.edu/files/ansc_8510_seminar_syllabus_16_fall.pdf) for further detail regarding seminar requirements Masters students are required to take four semesters of AnSc 8510 graduate seminar (1 credit per semester) and present one seminar each academic year. Ph.D. students are required to take six semesters of AnSc 8510 graduate seminar (1 credit) and present one seminar each academic year.

Facilities

Research Facilities

You may pursue graduate work in AnSc at the St. Paul campus or at one of the CFANS Research and Outreach Centers. Several other research facilities are potentially available to you as an AnSc student.

More information on the University of Minnesota research and outreach centers can be found on their website: <http://www.maes.umn.edu/centers-facilities/rocs>

Desk Space

Full-time graduate students are assigned desk and research space.

Keys

As a full-time graduate student, you are assigned a key to your office and U Card access to the building in which you work. Keys must be checked out through the Graduate Program Coordinator, and U Card access requests must go through the Administrative Director.

Computer Facilities

The AnSc Program does not maintain student computer facilities but views this as the responsibility of the faculty advisors. If the advisor does not offer computer access in your office or laboratory, you may reach out to UMN IT at help@umn.edu to inquire if a computer is available for your use. CFANS Office of Information Technology in the Twin Cities also allows students to check out Dell laptops for up to one week at no charge. See the website for more details and pickup locations:

<https://www.cfans.umn.edu/academics/undergrad-resources/laptop-checkout> .

St. Paul campus also has student computer labs. Computer resources can be located at this site: <https://www.cfans.umn.edu/academics/undergrad-resources/computer-labs/> .

E-Mail

All University faculty, staff, and registered students receive an e-mail account, Internet access and unlimited server space. You may access your account through the University's website or through one of the many communications kiosks on campus. A student e-mail address will automatically be assigned to you when you register. To activate your account, visit <http://www.umn.edu/initiate/> . The site requires you to enter your social security number, your birth date, and your student ID number. The site also describes how to change your password and customize your account. Another useful site for Internet access information is the Academic Computing and Distribution Services site:

<http://www.oit.umn.edu/accounts/> .

E-mail is widely used for individual, program, University, and professional communications, including financial transactions. For this reason, you must access your University account regularly. Many AnSc program updates are sent via e-mail. The AnSc uses a listserv to notify students of seminars, job opportunities, student group meetings, and other items of interest. Additionally, many job postings, calls for papers for conferences around the country, and other nationwide professional messages are distributed via e-mail.

If you decide to forward your University mail to another provider, be aware that other providers may not allow large attachments. Remember, your University email is your official address for University correspondence. Check your email frequently. All UMN-Twin Cities student and staff email addresses are available online in the Student-Staff Directory at: <http://onestop.umn.edu/>

AnSc Web Site

The AnSc Program web site <http://www.ansci.umn.edu/graduate-program> has a wealth of information about the program including up to date web pages for current faculty and students.

Mail

Graduate students receive campus and U.S. mail in the building where they are housed. Check with Graduate Program Coordinator about your mailbox arrangements. Boxes for outgoing campus mail and U.S. mail are located in most department offices. Be sure to regularly check your campus mail.

Telephones

Most graduate student offices have telephones or telephone access. Your advisor will provide details. The Student-Staff Directory, available at <http://onestop.umn.edu/> lists phone numbers, addresses, and e-mail addresses for University staff, students, colleges, departments, and services.

Conference Room

Conference rooms in Haecker Hall and AnSc/Vet Med are available for AnSc activities. They can be reserved for meetings, oral exams, and other appropriate gatherings. Reservations must be made through the AnSc office. Many students with assistantships in other departments will also have access to departmental conference rooms. Information on available spaces can be found here: <http://www.ansci.umn.edu/about-us/resources>

Fax Machine

A fax machine is available in the AnSc office in room 315 Haecker Hall. To use the fax machine, please ask for assistance. You also may have access to a fax machine in your

home department.

Copying Facilities

Copying privileges are assigned at the discretion of your advisor in the building where your office is located. Copying accounts are usually related to faculty research projects

Program Information

Program Goals

Student Learning Outcomes of the Animal Sciences Graduate Program were developed in two documents by the Director of Graduate Studies. The Animal Sciences Graduate Studies Committee revised the documents and distributed them to all Graduate Faculty and Students in the program. Feedback received from Graduate Faculty was incorporated into the documents, followed by an open meeting with Graduate Students. Based on the discussion, Graduate Faculty and Students voted unanimously to approve both documents (Appendix II and III) in March 2015 and were submitted to CFANS and the Graduate School. These documents will be reviewed and updated as necessary every three years.

Registration

Registration is completed online through your MyU portal: <http://z.umn.edu/myacademics>. You must supply the Graduate School with an official final transcript from your undergraduate college before you will be allowed to register. You need to meet with your faculty advisor to discuss your schedule for your first semester. If difficulties arise, consult the Graduate Program Coordinator.

If you are taking six or more credits and are a degree-seeking student, you are required to have hospitalization insurance. The University-sponsored hospitalization insurance will automatically be charged to your student account unless you provide the name of your insurance company and policy number. You will need your insurance information at the time of registration. To find out more information about available student health insurance plans, visit: <https://shb.umn.edu/>

Graduate School registration policy requires all students to register **every fall and spring term to maintain active status.**

Grad 0999

For students who have completed all coursework and thesis credit requirements and do not have to be registered to meet any other internal/external agency registration requirement (e.g., students who do not hold RA or TA positions with the University), the Graduate School offers Grad 0999 – a zero-credit, zero-tuition non-graded registration mechanism. Information at:

http://onestop.umn.edu/special_for/SpecialRegistrationCategoriesforGraduateProfessionalStudents.html#grad999 . There is a four semester limit for graduate enrollment in Grad 0999.

Full-Time Status with One Credit

AnSc Graduate Handbook

The Office of the Registrar and the Graduate School have developed procedures that permit eligible Advanced Master's and Doctoral candidates to be certified as "full-time" students when registered for only one credit. Master's students register for AnSc 8333 and doctoral students for AnSc 8444. Faculty advisors and the DGS will affirm that each student is working full time on the thesis or dissertation. These courses are intended only for advanced master's and doctoral students who have completed all their program coursework and required thesis credits, but are still working full-time on the research or writing of their thesis or dissertation. Master's students who plan to register for AnSc 8333 need to apply for advanced status well in advance (ca. 2 months prior) of the term they plan to register. More information on this is available for both MS and PhD programs at OneStop's website:

M.S.:

http://onestop.umn.edu/special_for/SpecialRegistrationCategoriesforGraduateProfessionalStudents.html#grad8333

Ph.D.:

http://onestop.umn.edu/special_for/SpecialRegistrationCategoriesforGraduateProfessionalStudents.html#grad8444

Degree Option – Minor

Students who are majoring in other fields may select Animal Sciences for a minor. Requirements are designed to fit the student's needs. A Master's minor requires 6 credits in areas not closely related to the major; no more than two of these credits may be in research or special problems. A doctoral minor requires 12 credits in areas not closely related to the major; no more than three of these credits may be in research or special problems. The Director of Graduate Studies must be consulted in advance for planning and approval of a minor program.

Graduate Degree Plan (GDP)

The GDP documents your course work and other details of your graduate program. It is the coursework contract between you and the University.

- For M.S. candidates University policy requires students to submit their GDP no later than one semester prior to graduation. (See here: <https://www.grad.umn.edu/sites/grad.umn.edu/files/otr201.pdf>) However the department recommends M.S. candidates submit a GDP to the AnSc office before the end of the second semester, or after completion of 15 credits, whichever comes first.
- For Ph.D. students University policy requires students to submit their GDP no later than one semester prior to graduation. (See here: <https://www.grad.umn.edu/sites/grad.umn.edu/files/otr204.pdf>) However, the department recommends Ph.D. students submit in their third semester of study.
- Students in a master's program who do not submit degree plans by the end of the semester following the completion of 15 credits receive a one-semester warning. Students in a Ph.D. program who do not submit degree plans by the end of the third semester in residence receive a similar warning.
- Failure to submit the degree plan within the one-semester warning period can result in a 'hold' being placed on your registration. You then must submit a degree plan before further registration will be allowed.
- The Graduate Degree Plan Form is available online at: <http://www.grad.umn.edu/students/forms/index.html> . You should fill out the form as completely as possible in consultation with your advisor, who must approve and sign it.

On the Graduate Degree Plan form:

- Include the academic term, course number and title, number of credits, and grade (if known) for each course. Also check whether the course is considered a major program or 'other' course in your related field/supporting program or minor.
- Be sure to include AnSc core courses, electives in your area of emphasis, and other courses taken in minor fields, supporting programs, or related fields. Calculate the total number of major and 'other' credits at the bottom

- of the page.
- Courses taken **for graduate credit** elsewhere that are to be officially transferred should be listed on the first page of the GDP. Indicate the school where the courses were taken and attach a copy of appropriate transcripts.
 - Do not list any courses you took as an undergraduate. If you wish to fulfill core course requirements with undergraduate courses, discuss this with the DGS.
 - Indicate any required thesis credits (10 credits of AnSc 8777 for an M.S. Plan A and 24 credits of AnSc 8888 for a Ph.D.) on the first page, rather than listing these in the coursework section.

The DGS reviews all degree plans to ensure compliance with Graduate School and program requirements, and to provide a quality control check for the program. It is not unusual for the DGS to contact you or your advisor for clarification of information on the Graduate Degree Plan form. The DGS may make technical corrections to the plan without consulting the student. After the form is reviewed and approved by the DGS, a copy is retained for your file, and the form is transmitted to the Graduate School. Once students receive the approved plan from the Graduate School, they should supply a copy to their advisor. After approval by the Graduate School, the form becomes your official program, and all items listed must be fulfilled before your degree will be awarded. However, your GDP may be revised by submitting a petition, if your proposed change is considered desirable. Petition forms may be found online at:

<http://www.grad.umn.edu/students/forms/index.html> .

Transferring Credits

The Graduate School limits transfer of credits to 40% of the course credits (up to 12) in Master's programs, and transfers require the approval of the DGS and Graduate School. For the Ph.D. program, there are restrictions on the transfer of credits from non-degree graduate credit registration. Credits may be transferred from other graduate programs at recognized institutions or from a Master's program at the University of Minnesota. The transfer of such credits requires the approval of the advisor and the DGS. The transfer of credits is accomplished by including the courses on the proposed GDP. Credits appearing on your undergraduate transcript cannot be transferred into the graduate program, even if those credits were taken in excess of the B.S. degree requirements.

Use of 4000-level Courses in Graduate Student Programs

Certain 4000-level courses may be included in the graduate program. Prior approval of the proposed course by the advisor and the Director of Graduate Studies is required.

Instruction of 8000-level Animal Sciences Courses

The policy of the Animal Sciences Graduate Faculty is to encourage instruction of 8000-level course offerings when four or more students have registered. Small enrollment graduate courses may be taught using alternative approaches. The

graduate faculty feel that 8000-level courses make an important contribution to graduate education.

Graduate Faculty

The AnSc graduate faculty members are listed on the AnSc website. All faculty members may serve on student committees as a representative of AnSc (the major), and most may serve as advisors of AnSc students. Most faculty members also are members of other graduate programs and in that role could serve as a related field/supporting program or minor member of an examining committee; however, one person can only represent one program for a given committee.

Faculty who are not on the AnSc graduate faculty cannot advise or co-advise AnSc graduate students and cannot represent AnSc on examining committees. Faculty may be nominated for membership in the AnSc program, subject to approval by the voting AnSc graduate faculty. A complete and up-to-date list of all University of Minnesota graduate faculty and their appointment status is at: <https://faculty-roles.umn.edu/>

Advisor

Incoming M.S. Plan A students and Ph.D. students will have an advisor. Graduate students have a much closer working relationship with their advisors than undergraduate students. Regularly scheduled meetings to discuss your program and progress are recommended, and all students must complete an annual review with their advisor during spring semester. Most students meet with their advisors weekly or bi-weekly, especially if they receive support as research assistants.

Situations occasionally arise in which a change of advisor is appropriate and desirable. You may find that your research interests match more closely with another faculty member, or personality conflicts may arise. You should not feel locked into your initial choice. At the same time, you should recognize that changing advisors is a major decision that should not be taken lightly, especially if you have been in the program for several semesters. In some cases, your advisor may have invested substantial time and financial support into your development. Before requesting a change, you must consider whether another faculty member is available to supervise your thesis and whether funding will be available. Except in rare circumstances, you should discuss the proposed change with your advisor. If that is not possible, you should meet with the DGS for advice and approval. When a change has been approved, you should write to your former advisor, your new advisor, the DGS, and the AnSc program office to notify them of the change. The GPC, Allison Berth, in the AnSc program office will complete the necessary online form to make the change.

Ethics Requirement

All graduate students in the AnSc program must complete an ethics requirement to graduate; this is mandated by the Graduate School. Both M.S and Ph.D. students are

expected to attend an ethics class. Students have a variety of course options that fulfill this requirement. There is no minimum credit requirement to fulfill the ethics requirement. Below are some options that fulfill this requirement:

- ANSC 5091 – Research Proposals: From Ideas to Strategic Plans (3.0 cr)
- ANSC 8134 – Ethical Conduct of Animal Research (3.0 cr)
- APSC 8123 - Research Ethics in the Plant and Environmental Sciences (0.5 cr)
- ENT 8061 - Scientific Communication and Ethics (1.0 cr)
- PBS 8123 - Research Ethics in the Plant and Environmental Sciences (0.5 cr)
- PLPA 8123 - Research Ethics in Plant and Environmental Sciences (0.5 cr)
- SOIL 8123 - Research Ethics in the Plant and Environmental Sciences (0.5 cr)
- WRS 8581 - Research and Professional Ethics in Water Resources and Environmental Science (0.5 cr)

Student Evaluations

The Graduate School requires annual evaluations of all graduate students. Students will complete the electronic AnSc Annual Student Review form, which provides a brief self-evaluation and report of accomplishments. Students should discuss this form with their advisor(s).

- After submitting the review form online, your advisor(s) will review the form and provide a brief summary assessment either on the form or in a separate e-mail to the DGS.
- The information you provide will allow us to assess support of students and also enable us to highlight your accomplishments in graduate school reports and in other efforts to promote the program. These evaluations should also serve to provide feedback on milestones and help ensure timely completion of your degree.
- Failure to complete the annual review will result in a hold on your registration.
- You should be sure to keep a copy of your annual review, as it will facilitate completing the form for the next year and may also be useful in resume and job application assembly.
- Students are required to meet with the DGS annually after the Spring Semester is completed.

Master's Final (Examining) Committee

The ***Master's*** final committee, which serves as the examining committee for the final oral exam, is established by an online process at:

<http://www.grad.umn.edu/students/assignmasterscommittee/index.html>. Final committees are established formally by the CFANS Dean's Office upon recommendation by the DGS. You and your advisor suggest committee members to the DGS based on the topic of research for your thesis.

- A GDP must be approved and on file before the M.S. final committee can be requested using the online process.
- Examining committees for master's degrees must have at least three members:

two from your major field, including your advisor(s), and one from outside your field. The outside member can be from AnSc, but they must also be part of another program.

- Committee members must be members of the appropriate graduate faculty of the University. Prior to submitting names to the DGS, you must visit the faculty you would like to serve on your committee. Most students have taken a course from each of their committee members, but there is no requirement that you do so.

Doctoral Preliminary Oral (Examining) Committee

The ***Doctoral*** preliminary oral exam committee is established after GDP approval, and the assignment of members to the preliminary oral exam committee should be completed at least one semester prior to the exam. You can assign your committee online at:

<http://www.grad.umn.edu/students/assignprelimcommittee/index.html> .

- This committee serves as the examining committee for the preliminary oral exam and usually, but not necessarily, the final oral exam (dissertation defense).
- A separate but related committee is formed for the Ph.D. written preliminary exam (see the Ph.D. preliminary written exam section for details).
- The AnSc program requires that Ph.D. preliminary and final oral exam committees have at least five members: three members from your major field (one outside of your immediate research area) and two from outside of your department.
- Outside members may have graduate appointments in AnSc, but must also have an appointment in the minor or supporting program; they should clearly represent an area of expertise beyond AnSc and your major area of emphasis. Ph.D. committees are chosen in the same way as Master's committees (see above). The student's advisor is generally chair of the preliminary oral exam committee.

Doctoral Final Oral (Examining) Committee

The ***Doctoral*** final oral (defense) exam committee will be established after you successfully complete your program requirements and preliminary exams.

- This is done here: <http://www.grad.umn.edu/students/assigndocfinalcommittee/index.html>, and must be completed at least one semester before your proposed exam date.
- For the final oral exam, the advisor (or co-advisor) cannot serve as the committee chair.
- Your committee must sign a Reviewer's Report (included in the downloadable graduation packet), and this must be submitted to the Graduate School prior to your defense. Every designated reviewer on the doctoral dissertation reviewer's report must certify that the dissertation is ready for defense before the doctoral final oral examination may take place.

Graduation

You must be a student with active status to graduate. You can maintain active status by registering each fall and spring semester. Graduation procedures are available on the Graduate School website: <https://apps.grad.umn.edu/secure/gradpacket/> (select your degree level). Follow these instructions carefully; everything must be completed, including payment of copyright and abstract fees, before you can graduate. As indicated in the following M.S. and Ph.D. sections, you should notify the AnSc office at least one week in advance of your defense with the time, location, and title of your defense presentation; you should also provide an abstract.

Time Limit for Degree Completion

Master's degree candidates must complete all graduate work within five years of enrollment, and **doctoral candidates** must finish all requirements within eight years from initial enrollment. Petitions for a one-year time extension may be submitted to the Graduate School. No more than two, one-year petitions will be considered for approval.

Thesis Copies

Follow Graduate School requirements for electronic submission, found at: <http://www.grad.umn.edu/students/ThesisSubmission/index.html> Ph.D. and M.S. students also must deposit one signed, bound copy of the thesis with the AnSc program office. Plan B students must deposit a copy of their Plan B project with the AnSc program office.

Master of Science (M.S.)

Animal Sciences graduate students pursuing the M.S. degree emphasize one of the Animal Sciences subdisciplines: genetics, nutrition, physiology and reproductive biology, or production systems. Students have the option of tailoring their program to include study in more than one subdiscipline, and to conduct basic or applied research.

Graduate students seeking a M.S. degree in AnSc may choose from two plans:

- Plan A, which requires a thesis. Students with funded research projects typically do a Plan A thesis

OR

- Plan B, which requires additional coursework and a major project rather than a thesis. Plan B programs are best suited for students without funded research projects.

The M.S. program ordinarily requires from three to five semesters in residence and cannot be completed in less than two semesters. At least 60% of the course work must be completed as a registered University of Minnesota Graduate School student. By the time the student completes 10 credits, they must file with the Graduate School an official GDP. The GDP lists course work completed and proposed, a proposed thesis title (Plan A only), and names of the members of the examining committee. The degree program is initially reviewed by the advisor and shown to the examining committee members for their input. The degree program is submitted to the AnSc DGS for signature, and then forwarded to the Graduate School for approval. The form can be downloaded from the Graduate School website: <http://policy.umn.edu/sites/policy.umn.edu/files/forms/otr198.pdf>

The minimum cumulative grade point average required for courses included in the official program for a M.S. degree is 2.80. Only grades of A, B, C and S are acceptable for inclusion on a Master's degree program. Grades of S are not calculated in the grade point average. The final exam consists of a public seminar followed by an oral examination. Students should submit a bound copy of the final thesis to the program's library.

Plan A: The M.S. Plan A option is best suited for students with a funded research project. The Plan A option provides a more research-intensive background.

- Coursework: Plan A requires a minimum of 30 credits
 - 14 course credits in your major field,
 - 6 credits outside of major field or a designated minor (please note that the required number of credits to obtain a minor is set by the program in which the minor is taken),
 - 10 credits of thesis work (AnSc 8777); thesis credits can be taken at any time.
- Thesis: Plan A also requires the successful completion and defense of an M.S. thesis
 - Coursework is individualized to reflect a student's preparation, degree goals, and research topic;
 - Thesis must be written on a research project that you carry out in consultation with your faculty advisor. Specific formatting guidelines for

your thesis are available on the Graduate School's website:

<http://www.grad.umn.edu/students/ThesisSubmission/index.html> ;

- You must present a bound copy to the AnSc Program Office. Check with your advisor for their copy requirement.

Plan B: Plan B is best suited to students who do not have a funded project that will cover research expenses and provide an assistantship. Students accepted without funding should consider the Plan B option, which generally can be completed in less time, or at an individualized part-time pace.

- Coursework: Plan B requires a minimum of 30 credits
 - 14 semester credits in the major field,
 - 6 semester credits outside of major field or a designated minor (Note that the number of credits for the minor is set by the program in which the minor is taken),
 - 7 credits of additional coursework, divided in any appropriate manner between the major field and related field or minor program (subject to approval by your advisor).
 - Students are not required to register for any credits of Plan B work. However, students may count three semester credits of AnSc 8095 (Plan B research) toward their degree.
- Plan B Project(s): No thesis is required, but each student must demonstrate the ability to work independently by writing one project paper.
 - Best suited for students with few previous courses in Animal Sciences and thus need more course work to gain the combination of depth and breadth needed in this field,
 - Project must be approved and overseen by the faculty advisor,
 - Must utilize field, laboratory, or computer work and the analysis, synthesis, or interpretation of data.
- Plan B students should provide a copy of their Plan B project with the AnSc Program Office after a successful final oral exam

A minimum of 30 credits is required. These must include 14 or more credits in the major area and at least 6 credits in one or more related fields outside the major. The balance of credits is chosen by agreement between the advisor and student. In addition to course work, a project(s) is to be conducted that requires approximately three full-time work weeks or 120 hours to complete. The nature and extent of the project is agreed upon in advance by the student and faculty advisor. The project requirement can be satisfied in conjunction with, or independent of, the courses in the student's program.

Related Field

You must take at least 6 semester credits of course work outside the AnSc major. Examples include courses in statistics, economics, microbiology, and chemistry. Many other possibilities exist.

Final Oral Exams for M.S. Degrees

Other than exams in courses, the final oral examination is the only exam taken by an M.S. candidate. The composition of the examining committee is described in the sections on Degree Plan Forms and ***Master's Final (Examining) Committee***. Once your thesis or Plan B papers are nearly ready for review by your committee, request a graduate packet from the Graduate Student Services and Progress Office (GSSP) online at: <http://www.grad.umn.edu/students/masters/index.html> .

- Oral exam formats for Plan A and Plan B candidates are described in the sections below.
- If possible, final oral exams should not be scheduled for the period between June 15 and the start of the fall semester.
- You should discuss the format of your oral exam with your advisor well in advance of its scheduled date.
- M.S. final oral exams are open to the public. Please inform the AnSc office of your defense seminar at least one week in advance, including the date, time, and an abstract from your thesis or project. The office will send out an announcement to faculty and students.

Plan A Final Oral Exams

The final oral exam is primarily a thesis defense. The exam consists of two parts:

1. Public seminar by the student, covering the objectives of the thesis, technical approach, results and conclusions.
2. Defense of the work to the examining committee in a closed session.

The time and place of the exam are announced in advance. As a minimum, announcements should be distributed to the AnSc faculty and students on the campus at least a week in advance of the exam. In addition to sending this information to the AnSc office for distribution, you should also have an announcement posted in the building in which you have done your research.

It is recommended that oral presentations last about 30 – 40 minutes. You and your advisor should decide on the length of your presentation. Consult with your advisor for help in selecting material and for advice in making an effective presentation. It is a good idea to practice the seminar in front of graduate students in your advisor's group before the exam date. Be sure to start your talk by describing your main objectives and why the work was done, and end by summarizing your important findings and conclusions. Also, be sure to acknowledge assistance you received from other persons in doing the work and funding assistance from granting agencies or fellowships. Although questions of clarification may occur during the presentation, most questions are reserved until the end of the presentation when the general audience is allowed to ask questions about the work. When there are no further questions from the general audience, they are asked to leave and the second part of the thesis defense takes place.

As chair of the examining committee, your advisor will normally ask each committee member in turn to ask his/her questions before moving on to the next examiner. Questions usually arise directly from the thesis or the oral presentation. However, you should be prepared for the possibility that a line of questioning may lead beyond the narrow confines of the thesis material. For example, questions about a statistical method you used or how you performed an analysis may lead to broader questioning to gauge your understanding of the method and other procedures that may have been appropriate to address the issue at hand.

M.S. thesis defenses typically last between two and three hours. Because questioning is open-ended, you should be sure to schedule enough time to allow the committee to complete its questioning. To be on the safe side, you should reserve the exam room for a three-hour period and make sure that committee members are available for the entire period.

Scheduling the thesis defense is often a difficult and time-consuming process. You should begin preparing as soon as your advisor gives you the “go ahead.” Typically, this will occur when your advisor regards your thesis draft as ready for review by the rest of the committee. Committee members need a reasonable amount of time to read the thesis, and you cannot schedule the thesis defense sooner than two weeks after committee members have received their copies. To allocate sufficient time to read the thesis and decide whether it is ready for defense, students must notify their advisor and other members of the final oral committee at least two weeks before the thesis arrives at their offices that it will be delivered on a particular date, that is, the examining committee should be notified of your intention to defend at least four weeks in advance of your tentative date. All members of the examining committee must then have at least two weeks to read the thesis after it has been delivered. These are minimum standards set by the Graduate School.

After the committee has had time to review your thesis and before scheduling your oral defense, you must obtain the signatures of each committee member on a form verifying that the committee has found the thesis ready for defense. You must obtain this Reviewer’s Report form from the GSSP (downloaded with the Graduation Packet online) and return it to the GSSP office so that you can pick up the Final Exam Form (where your committee will indicate if you have passed or failed), which is needed at the oral exam. Occasionally reviewers will determine that substantial revision is required before the thesis is ready to defend, and their concerns must be addressed before the defense can proceed.

Finally, it is your responsibility to arrange the exam time with the committee, schedule the exam room, and see that the exam announcements are distributed. Students must contact the AnSc office in the Twin Cities before the exam to ensure that the announcement is distributed to the AnSc e-mail lists. You may also contact the AnSc office if you need assistance with scheduling an exam room.

Plan B Final Oral Exam

The basic format for this exam is similar to that for the M.S. Plan A exam.

1. A public seminar is given on the Plan B project, and
2. Questioning from the committee follows in closed session.

The time and place of the exam are announced in advance and arranged to be accessible to interested faculty and students.

Differences in the exam formats reflect the fact that Plan B projects are shorter and less complicated than theses. Consequently, the seminar may be shorter. Because Plan B programs are more course-intensive, the examining committee may spend relatively less time addressing the Plan B project and more time on questions related to course work. Such questions still tend to evolve from the topic of the project and presentation, but you should be ready for general questions in the areas of the AnSc core and your area of emphasis within AnSc.

The student is responsible for:

- Arranging the time and place of the exam
- Contacting their committee members
- Providing them with copies of the Plan B report (similar to the responsibilities for the Plan A defense except that there is no GSSP Reviewer's Report form for the Plan B project report).

Because M.S. final oral exams are open to the public, you should plan to attend a few before your own is scheduled so that you will be familiar with the way they are run. If you have any questions about this process, or need assistance with scheduling a room for your defense, contact the AnSc program office.

Checklist-M.S.

- Form filed with the Graduate School. During your second or third semester you must file an official degree program form with the Graduate School. The form lists:
 - 1) Course work completed, including transfer credits, and courses to be taken that will be used to fulfill degree requirements.
 - 2) Examining committee members (in addition to your advisor, select one Animal Sciences Graduate Faculty member in your area of study, and one faculty member from another graduate program).
 - 3) Title of your thesis (Plan A).
- Met with committee members. Call a meeting of your examining committee members to discuss course work and thesis research. Have each committee member initial the program form. The meeting should take place before the program form is submitted to the DGS for signature.

Registration of the Thesis Title (Plan A)

- Notified committee members as to the date they will be given a copy of the thesis to review. You need to notify committee members at least two weeks in advance as to the date they will receive a draft copy of the thesis to review.
- Delivered thesis to committee members for review. Committee members must be given a minimum of two weeks to review the thesis.
- Submitted a copy of the title page to the Graduate School. When this is done the Graduate School will provide the thesis reviewers report form and other forms necessary for graduation.
- Committee members signed thesis reviewers report. Upon returning the signed thesis reviewers report to the Graduate School, you will be given the final examination report form.

Final Examination

- Notice of public seminar. The date, time, location and title of the public seminar that immediately precedes the oral examination must be sent electronically to all Animal Science Graduate Faculty members and students at least one week in advance.
- Returned signed final examination report form to the Graduate School.
- Submitted two signed and completely finished copies of the thesis to the Graduate School (Plan A) and one copy to the Department of Animal Science.

Doctor of Philosophy (Ph.D.)

The Ph.D. is a research degree that represents the highest level of academic accomplishment in any field. Persons with this degree are expected to have demonstrated the ability to conduct independent research and should also have the level and breadth of knowledge about their field that one could reasonably expect of someone who has attained the highest academic degree in their field. Research performance, evidenced by the preparation of a dissertation on an independently pursued research topic, is the primary requirement for the Ph.D. degree. Each student degree program is designed in consultation with a faculty advisor to meet the special needs of the student, and must be approved by the DGS.

Animal Sciences graduate students pursuing the Ph.D. degree emphasize one of the Animal Sciences subdisciplines: genetics, nutrition, physiology, or production systems. Students have the option of tailoring their program to include study in more than one subdiscipline, and to conduct basic or applied research.

The Doctor of Philosophy (Ph.D.) in Animal Sciences consists of:

- Coursework equivalent:
 - 24 coursework credits minimum
 - 6 coursework credits must be from AnSc 8510 Graduate Seminar
 - Appropriate graduate level courses taken at another university may be transferred to a University of Minnesota program if approved by the student's advisor, the Graduate Studies Committee, and the Graduate School.
 - Coursework completed under a M.S. program at an accredited institution can be counted towards the Ph.D. degree.
- Ph.D. students may choose to enroll in a minor or appropriate supporting program courses as follows:
 - 12 semester credits of course work outside the AnSc major. In certain cases, it may be desirable to have a supporting program course from the AnSc related field list but the course must represent a distinctly different area;
 - Minor coursework must be approved by the DGS from the designated minor.
- Dissertation

The AnSc program does not have a rigid criterion regarding the number of 8000-level coursework credits that are appropriate for Ph.D. programs because the availability of such courses varies widely among academic areas. Nonetheless, students should be aware that the Ph.D. represents the highest level of scholarly achievement; Ph.D. programs should thus include a strong representation of advanced-level courses in your major field.

Teaching Experience

Students pursuing a Ph.D. degree are required to have a minimum of 40 hours of teaching experience. This requirement must be met within a one-year period. The

teaching experience must include at least one of the following: lecture, laboratory instruction, oral extension presentation, or extension problem solving. Alternatively, Ph.D. students may enroll in a Preparing Future Faculty course available through the University's Center for Teaching and Learning. (<http://cei.umn.edu/support-services/preparing-future-faculty>) Students should discuss the teaching requirement with the faculty advisor and the DGS for prior approval; some proposals for meeting the teaching requirement may require consideration by the Graduate Studies Committee.

Plan of Study

The student and the advisor, with consultation of the students' program committee members develop the Ph.D. graduate plan of study. Students concentrate their studies in a subdiscipline area within the Animal Sciences major. A formal minor area may be selected from another graduate program to complement the Animal Sciences major. Requirements for a minor vary depending upon the particular graduate program. The Director of Graduate Studies for the graduate program of the selected minor should be consulted in advance for planning and approval of a minor program. Students with a broad range of interests may opt for a supporting minor program rather than a formal minor, a choice that allows more latitude than a formal minor in course selection. The supporting minor still requires in-depth knowledge in one or more areas of study that integrate well with the Animal Sciences major. The student's Ph.D. program committee and the Director of Graduate Studies is responsible for approving this option.

Graduate Degree Plan

A student must file an official Ph.D. program form by the fourth semester after initial registration. The program form must be submitted at least one semester before the term in which the preliminary written exam is to be taken. The program form includes a list of graduate courses completed or proposed in the major and in the minor of supporting fields. Transfer credits will be considered when the program form is reviewed by the Director of Graduate Studies, the Graduate Studies Committee and the Graduate School. The program form also requires the student to list the preliminary oral examining committee members. In addition to your advisor, select two or more Animal Sciences Graduate Faculty members in your area of study, and one or more faculty member from another graduate program that represents your minor or related field of study. The form can be downloaded from the Graduate School website:

<http://policy.umn.edu/sites/policy.umn.edu/files/forms/otr198.pdf>

Ph.D. Preliminary Exams

Students should plan on taking the written preliminary examination within 4-5 semesters in residence for the Ph.D. degree. The written exam must be passed before the oral exam is scheduled. Only after passing both exams are students admitted to "Ph.D. candidacy." You can then begin to register for dissertation credits (AnSc 8888); as such it is to your advantage to pass these exams as soon as possible. You do not need to complete all of your course requirements before the preliminary exams. It is fairly common for examining committees to recommend additional coursework as a result of your oral preliminary exam.

Therefore, it is in your best interests to proceed with the oral preliminary once you think you are nearing the end of your program coursework.

Preliminary Written Exam: The written preliminary examination in Animal Sciences evaluates in-depth knowledge in one of the animal science areas of emphasis. The examination will evaluate the specific competence of the student in the area of emphasis. The student can be expected to be examined in depth. Students have two format options to choose from when taking their preliminary written exams:

Option 1: Written Preliminary Examination –

1. The Graduate Faculty in Animal Sciences will be asked to submit questions for students taking their written preliminary examination.
 - a. The exam will be closed book. The Graduate Studies Committee determines the number of questions and whether some question(s) is/are mandatory.
 - b. The Director of Graduate Studies will supervise the examination, have the answers graded, collect the grades and comments of graders, and determine a pass or fail grade on the basis of the reports of graders.
 - c. The Graduate Studies Committee will report its decision and a summary of the graders' comments to the advisor, and the advisor will report the outcome to the student. Every effort will be made to notify the student of the outcome within two weeks of the examination. The result of the examination is reported to the Graduate School on the standard form after it has been signed by the Director of Graduate Studies and by the advisor.
2. The examination will evaluate the specific competence of the student in the area of emphasis. The student can be expected to be examined in depth.
3. Examinations will be given twice a year in March and September (exceptions may be made due to unusual circumstances).
4. Students should plan on taking the written preliminary examination within 2-3 semesters following completion of the M.S. degree, or within 4-5 semesters in residence for the Ph.D. degree.
5. The student takes the examination after obtaining the consent of his/her advisor. The Director of Graduate Studies is to be notified at least six weeks in advance of the examination date or as specified in annual scheduling of the exam.
6. Each examination answer will usually be graded by the person submitting the question and one other person designated by the Committee. If the two graders differ by more than one full letter grade, then a third grader for that

question will be selected by the Director of Graduate Studies. The three grades will be averaged.

7. A minimum average grade of 3.00 (or B) is required to pass the examination.
8. In case of failure, the student will, at the discretion of the Graduate Studies committee, be allowed only one opportunity to be re-examined. The re-examination will be given at the next regularly scheduled exam. It will not be permitted earlier nor later than the next scheduled examination.

Option 2: Thesis Proposal — The thesis proposal should be completed within two years after starting the Ph.D. program. The thesis proposal should be written independently by the student and be as original as possible. You should plan on completing your final oral presentation no later than 10 weeks after you complete your thesis proposal. The thesis proposal should include:

- Chapter 1
 - Justification of the problem
 - Background
 - Literature review
 - Hypothesis and objectives
- Chapter 2
 - Preliminary data (optional) — if it is available and relates to the proposed work
- Subsequent Chapters
 - One chapter for each major hypothesis, objective or specific aim; you should have at least two or three such specific aims or chapters
 - Hypothesis, Objective(s)
 - Plan of work; including purpose, design, data analysis, limitation and pitfalls
 - Methods

There is no minimum or maximum length for the thesis proposal. It should be comprehensive and detailed. Plan on allowing at least six weeks to write it. Then:

- Schedule a date, time, and location for your proposal presentation.
- At least three weeks before your presentation, submit a copy of the proposal to each member of the thesis committee.
- Download a copy of the Preliminary Written Examination Report from the Department of Animal Science website (currently at: https://www.ansci.umn.edu/sites/ansci.umn.edu/files/prelim-written_exam_form.pdf)
- Give your presentation. The committee may suggest or require that changes be made.
- If so, make the corrections.
- Submit a revised copy of the proposal to each member of the committee.

Once the committee is satisfied with the proposal, the Preliminary Written Examination Report form is signed by your advisor, co-advisor (if applicable), and the Director of Graduate Studies.

Preliminary Oral Exam: The oral preliminary exam is the last major milestone before Ph.D. candidacy. The exam must be scheduled with GSSP (<http://www.grad.umn.edu/students/prelimschedule/index.html>) as soon as possible following the successful completion of the written preliminary examination, but not later than two months after receiving notification of a passing grade on the written preliminary examination. Only after passing the preliminary oral examination is the student considered a candidate for the Doctor's degree.

You should expect:

1. Copies of all written preliminary examination questions and the student's answers will be distributed to the entire examining committee prior to the oral preliminary examinations.
2. The oral preliminary examination shall cover both the major and minor (if applicable) fields or supporting program and may include any work fundamental thereto, including possible plans for thesis research.
3. It is strongly recommended that Ph.D. students write a thesis proposal to be distributed to their examining committee prior to the oral preliminary examination.

You should be prepared to:

1. Explain your research plan and the scientific principles behind any methods you will be using.
2. Demonstrate knowledge of the fundamental concepts in the core areas of Animal Sciences, as well as in your areas of expertise.

At the same time, you should realize that while examining committees are established to protect the academic standards of the program, their goal is to see that students succeed. While committee members may test the limits of your knowledge, they do not do so with the intention of finding a question that you cannot answer so that they can fail you. No committee wishes to see a student fail!

It is your responsibility to find a time at which the committee can meet for the exam, to arrange an appropriate exam room, and to see that the necessary audio-visual facilities are available. Exams are usually held in the building where the student and advisor's office and lab are located; Haecker Hall room 365 is available for preliminary exams on the Twin Cities campus.

At the conclusion of the examination, the student's committee votes, discusses, and votes again, following the rules prescribed by the Graduate School on the exam form (sent directly to the committee chair).

- Possible outcomes are: pass, pass with reservations, or fail.
- The committee may decide to allow a person who fails the preliminary oral exam to retake it one time.
- Pass with reservation indicates that the committee was not satisfied with some aspect(s) of the student's knowledge or preparation; the specific deficiencies and requirements for rectifying those deficiencies (e.g., additional coursework, writing a review paper, etc.) must be explained to the student immediately after the exam, and a written explanation provided within one week of the exam. The reservation must be lifted before the student can proceed to the final defense.

When a student has successfully completed the preliminary written and oral exams, they become official "Ph.D. candidates."

Ph.D. Dissertation

Thesis Title Form

At the time of submission of the doctoral program, or not later than the first quarter after passing the preliminary oral examination, the student shall file with the advisor's approval the title of the doctoral dissertation. The Graduate School requires that the thesis title be accompanied by a typewritten statement of approximately 250 words, describing the research to be undertaken and the methods to be used in conducting and evaluating it.

Assigning Doctoral Final Examination Committee: The Doctoral Final Examination Committee must have at least four members including:

- Three AnSc graduate faculty members, including your advisor(s),
- At least one member representing a field outside of AnSc,
- One member from your minor field, if you have declared a minor.

Members cannot represent both AnSc and an outside field or minor during your defense. However, some AnSc graduate faculty also hold appointments in other fields, and could therefore serve as the 'outside' member on your committee. Outside members may be from another department within the College, another College within the University of Minnesota, from another University, from a government institution (such as USDA), or from the industry. To request an outside committee member from outside of the University of Minnesota, please contact the GPC.

Your committee is not required to include the same members who served on the preliminary oral exam committee. Your finalized committee selections must be submitted a minimum of one month prior to your defense, and will be approved by your advisor, the DGS, and the College of Food, Agricultural and Natural Resource Sciences. You can submit your committee selection online (<http://www.grad.umn.edu/students/doctoral/index.html>).

Preparation for Dissertation: Specific formatting guidelines for your thesis are

available on the Graduate School website:

<http://www.grad.umn.edu/students/ThesisSubmission/index.html> .

You should download your Graduation Packet from the Graduate School's website (<http://www.grad.umn.edu/students/doctoral/index.html>) by no later than the first day of the month in which you would like to defend your dissertation.

Your graduation packet will include your Reviewer's Report Form, which you must distribute to your Thesis Reviewers. At least three members of your committee, including your advisor(s) must review your thesis and sign a Reviewer's Report to verify that you are ready to defend. Once this form is submitted to the Graduate School, you will receive your Final Exam Form for your defense (which will record the votes of pass or fail).

Final Oral Examination for the Ph.D. (Dissertation Defense): The final oral exam is a defense of your dissertation.

- After your advisor has approved your dissertation, provide copies to all committee members, including your Thesis Reviewers (see above).
- Allow a minimum of two weeks for the reviewers to read your dissertation.
- The Reviewers Report form must be on file at the Graduate Student Services and Progress (GSSP) before the examination. Students may schedule their exam with the GSSP before submitting the Reviewers Report form.
- Doctoral students are expected to schedule their defense at least one week in advance. Schedule your final oral exam with GSSP (<http://www.grad.umn.edu/students/finalschedule/index.html>).

Your Final Oral Examination will include:

- A seminar (approximately 45 minutes) which is open to the public, where you will present your major findings
- A question and answer session (reserved for after your presentation) with your audience. (Approximately 15 minutes.)
- A closed-door meeting with your committee, consisting of questions focused on your dissertation.

At the conclusion of the examination, your committee discusses and votes to pass or fail. A failing grade on the dissertation defense ends the person's Ph.D. program. A grade of pass may still involve a need to make changes in the dissertation before it is acceptable. All committee members must sign the original form, indicating their decisions. New Graduate School policy indicates that committee members may delay signing the form until all appropriate revisions are made.

Once all required changes are made, you may prepare final copies of your dissertation. The Graduate School requires electronic submission of dissertations. You must also submit one bound copy to the AnSc program office, and you may need to submit a copy to your advisor as well. Your advisor must sign the original cover

page of each copy.

Be sure to fill out all required forms (dissertation abstracts, student survey, copyright, etc.) and pay all appropriate fees by the end of the month in which you expect to graduate. The Graduate School will not date your graduation until all requirements are met and fees are paid.

Checklist-Ph.D.

- Form filed with the Graduate School. During your second year of study and at least one semester before you plan on taking the preliminary oral examination you are expected to file an official degree program form with the Graduate School. The form lists:
 1. Course work completed, including transfer credits, and courses to be taken that will be used to fulfill degree requirements
 2. Preliminary oral examining committee members (in addition to your advisor, select two Animal Sciences Graduate Faculty members in your area of study, and one faculty member from another graduate program).

- Met with committee members. Call a meeting of your committee members to discuss course work and thesis research. Have each committee member write their initials on the program form. The meeting should take place before the program form is submitted to the DGS for signature.

Preliminary Written Examination

- Notified DGS on intention to take the preliminary written examination. The written examination is generally given during the last week of March and September. During the first week of March or September, depending upon when you plan to take the exam, notify the DGS in writing of your intent to take the examination. State this, and also list on the same page the courses you have completed, and brief summaries of research projects that you are or will be conducting.

- Submitted the preliminary written examination report form to the Graduate School. Obtain a written examination report form from the Animal Sciences Program assistant and have your advisor and the DGS sign the form.

Preliminary Oral Examination

- Notified the Graduate School of the date of the preliminary oral examination. After passing the preliminary written examination you may schedule the preliminary oral examination. Notify the Graduate School at least one week before the date the exam is to take place. The Graduate School sends the chair of the examining committee the preliminary oral examination report form.

- Returned the preliminary oral examination report form to the Graduate School. Return the form no later than the first workday following the examination.

Thesis Proposal

- Submitted thesis proposal form. At the time of filing the official degree program form but no later than the first semester after passing the preliminary oral examination you must submit a thesis proposal form. The form includes the thesis title, a summary of

the thesis project and designates three committee members as thesis reviewers. Before designating committee members as thesis reviewers you need to ask them if they would be willing to serve as thesis reviewers.

Registration of the Thesis Title

- Notified committee members as to the date they will be given a copy of the thesis to review. You need to notify committee members at least two weeks in advance as to the date they will receive a draft copy of the thesis to review.
- Delivered thesis to all committee members for review. Committee members must be given a minimum of two weeks to review the thesis.
- Submitted a copy of the title page to the Graduate School. When this is done the Graduate School will provide the thesis reviewers report form and other forms necessary for graduation.
- Committee members signed thesis reviewers report. Upon returning the signed thesis reviewers report to the Graduate School, the Graduate School authorizes the final examination.

Final Examination

- Notified the Graduate School of final examination date. Schedule a time with your committee members for the final examination. You must schedule the final examination and notify the Graduate School at least one week before the date of the examination. The Graduate School will send the final examination report form to the chair of the examining committee. There must be a minimum of ten weeks between the date the preliminary oral examination was passed and the date of the final examination.
- Notice of public seminar. The date, time, location and title of the public seminar that immediately precedes the oral examination must be sent electronically to all Animal Sciences Graduate Faculty members at least one week in advance.
- Returned signed final examination report form to the Graduate School. Return the form no later than the first workday following the examination, or after all reservations have been satisfied.
- Submitted two signed and completely finished copies of the thesis to the Graduate School.
- Submitted bound thesis to grad program's library

Definitions and Descriptions

Graduate Assistants: Students with appointments that require service in return for financial support, such as Research Assistant (RA) and Teaching Assistant (TA). Titles and compensation vary.

Graduate Fellows: Students who hold appointments (i.e., receive monetary stipends) that do not require any services. Titles and stipends of graduate fellows vary. Examples: Graduate School Fellows, and Graduate Fellows. It is expected that graduate fellows carry out research toward the completion of a Plan A Master's thesis or a Ph.D.

Academic Year: Two academic terms: fall and spring semesters (early-September to mid-May). The University also has a summer session divided into two equal periods.

Full-time & Part-time Graduate Student: Students registered for six or more course or thesis credits (or a combination thereof) are full-time students. Students registered for fewer than six course or thesis credits are part-time students. Tuition is the same for students registering for 6-14 credits and is calculated per credit for 1-5 credits or credits exceeding 14 in a semester.

Thesis Research: Research to satisfy requirements for a Plan A master's degree or a doctorate. Students should be registered for thesis credits during this time (minimum total of 10 for master's and 24 for doctorate).

Doctoral Candidate: Refers to a student who has passed the preliminary written and oral exams for the Ph.D. degree.

International Student: Any student who is not a citizen or permanent resident of the United States.

International students usually hold a passport bearing a student entry visa to the United States. This definition is the same as that used by the International Student and Scholar Services Office (612-626-7100), which should be consulted for any questions regarding international student status.

Resident: Residents of Minnesota pay fees at the in-state rate. Graduate Assistants who have at least 25%-time appointments and their spouses are counted as residents with regard to payment of fees. Minnesota also has reciprocity programs (which allow you to qualify for a lower tuition rate) for Wisconsin, North Dakota, South Dakota, and province of Manitoba, Canada residents. (More information on reciprocity can be found at:

http://onestop.umn.edu/finances/costs_and_tuition/tuition_and_fees/reciprocity/index.html .)

Director of Graduate Studies (DGS): The DGS is responsible for the operation of the graduate programs and chairs the Executive Committee.

Graduate Program Coordinator (GPC): Provides supports and advises the DGS, faculty, and students. Contact the GPC, Allison Berth (berth034@umn.edu) with any program related questions.

Graduate Studies Committee: General oversight responsibility for academic matters pertaining to AnSc graduate programs, as well as issues related to the status and well-being of AnSc graduate students

Useful Contacts

Animal Sciences Program Office

Saint Paul Campus – 305 Haecker Hall (612) 624-3491
<http://ansci.umn.edu/>

Bookstores

Twin Cities Coffman Memorial Union Store, Minneapolis Campus (612) 625-6000
St. Paul Store, St. Paul Campus <http://www.bookstores.umn.edu/> (612) 624-9200

Career Services

St Paul Career Center (612) 624-2710
<http://www.careerhelp.umn.edu/>

Computer Facilities and Wireless Access

Twin Cities Computer Labs: <http://www.oit.umn.edu/computerlabs/>
Twin Cities Wireless: <http://www1.umn.edu/wireless/>

Computer Help Line

Twin Cities (612) 301-4357

Copy Centers

St. Paul Student Union Copy Store, Rm. 8, St Paul Campus (612)625-4771
<http://www.printing.umn.edu/copycenters/index.html>

Council of Graduate Students (COGS)

405 Johnston Hall, Mpls (612) 626-1612
<http://www.cogs.umn.edu/>

Counseling and Mental Health Services

Twin Cities - <http://www.mentalhealth.umn.edu/>

University Counseling and Consulting Services (612)624-3323
109 Eddy Hall (East Bank) & 199 Coffey Hall (St Paul Campus)
<http://www.uccs.umn.edu/index.html>

Boynton Mental Health Clinic (612) 624-1444
<http://www.bhs.umn.edu/east-bank-clinic/mental-health-services.htm>

Fee Payments - Bursar's Office

107 Coffey Hall, St. Paul Campus (612) 625-8108
<http://onestop.umn.edu/finances/pay/index.html>

Financial Aid Information

Twin Cities – 210 Fraser Hall (612) 624-1665
<http://www.onestop.umn.edu/onestop/financialaid.html>

General Campus Information

St. Paul	(612) 625-9794
Graduate Assistant Employment Office 319 15th Ave. SE http://www1.umn.edu/ohr/gae	(612) 624-7070
Graduate Assistant Health Insurance Office N-323 Boynton https://shb.umn.edu/office-student-health-benefits/about	(612) 624-0627
Graduate Student Services and Progress (GSSP) Office 333 Robert H. Bruininks Hall (Minneapolis Campus) https://www.grad.umn.edu/current-students/gssp	(612) 625-3490
Health Services St. Paul – 109 Coffey Hall http://www.bhs.umn.edu/east-bank-clinic/index.htm Dental Clinic - Moos Health Tower Pharmacy – 410 Church St. SE	(612) 624-7700 (612) 624-9998 (612) 624-7655
Housing Services Twin Cities – Comstock Hall East http://www.housing.umn.edu/	(612) 624-2994
International Student and Scholar Services Twin Cities – 190 Hubert H. Humphrey School https://isss.umn.edu/	(612) 626-7100
On-Campus Post Office St. Paul Postal Station, St. Paul Student Center http://sua.umn.edu/locations/postal-stations/	(612) 625-9794
Registration, Records & Admissions 130 Coffey Hall http://www.onestop.umn.edu/onestop/registration.html	(612) 624-3731
Student Conflict Resolution Center http://www.sos.umn.edu/	(612) 624-7272

Best Advising Practices for Graduate Student Success

Best practice	Student's and advisor's joint responsibility	Adviser's responsibility	Student's responsibility
<p>Establish milestones for academic and research progress</p>	<ul style="list-style-type: none"> • <u>Within 60 days</u>: Discuss and agree upon milestones to track student progress • <u>By 2nd semester for M.S. student and no later than 2nd year for Ph.D. student</u>: Establish advisory and/or exam committee(s) (program dependent) and develop a course work plan • <u>Annually</u>: Document and review student progress 	<ul style="list-style-type: none"> • Communicate expectations with respect to independence, and how student is to function in the fairly unstructured graduate school environment • Clarify availability of continued funding (e.g., Assistantship or Fellowship) 	<ul style="list-style-type: none"> • Clearly understand your own motivations for going to graduate school! • Seek alternative or supplemental funding, as needed • Consult Director of Graduate Studies (DGS) or Plan Level Coordinator (PLC) to ensure that program requirements are met on time
<p>Maintain open lines of communication and provide timely feedback</p>	<ul style="list-style-type: none"> • Discuss an optimum meeting frequency and meet regularly • Establish written expectations and schedules; update as necessary as the degree program progresses, or with changing circumstances 	<ul style="list-style-type: none"> • Comment on student's work (reports, draft posters, seminar presentations, manuscripts, etc.) within 30 days • Communicate developments that may impact time to degree (e.g., planned absences or sabbaticals, or termination of funding) • Understand cultural differences that might affect communication 	<ul style="list-style-type: none"> • Submit progress reports, draft posters, seminar presentations, manuscripts, thesis drafts and other research work in a timely manner • Inform advisor of changes in schedule, including any paid or unpaid leave • Seek help from advisor or from other sources (see next page) to resolve difficulties

<p>Understand the terms and conditions of Graduate Assistant employment</p>	<ul style="list-style-type: none"> • Ensure that offer letters and terms of employment are understood • Comply with business practices of the department 	<ul style="list-style-type: none"> • Understand graduate student rights (see next page) • Provide a safe work environment free from intimidation, humiliation, or harassment 	<ul style="list-style-type: none"> • Complete any required training (e.g., safety, responsible conduct of research, ethics) in a timely manner
<p>Develop research ideas and graduate student career goals</p>	<ul style="list-style-type: none"> • Agree on the scope and sequence of thesis research (thesis proposal) and engage at all stages • Clarify expectations for multiple tasks (e.g., teaching, work/life balance) • Develop student career goals; revisit and revise periodically 	<ul style="list-style-type: none"> • Give constructive feedback on student's research ideas • Mentor students as they apply for jobs and advise on effects to their degree plan 	<ul style="list-style-type: none"> • Keep a journal of research ideas and activities, and present to your advisor • Ask questions • Seek professional development opportunities, awards, and funding opportunities
<p>Connect with the larger campus and professional community</p>	<ul style="list-style-type: none"> • Recognize and respect cultural differences • Seek opportunities for leadership and professional development skills such as: public speaking, research ethics, working across differences, collaboration, conflict resolution and data management 	<ul style="list-style-type: none"> • Help students network with colleagues at other institutions • Support student participation in scientific conferences, campus seminars and on committees within the U of M and CFANS 	<ul style="list-style-type: none"> • Attend campus seminars and events • Serve on committees within the U of M and CFANS • Participate in graduate student orientation and recruitment activities • Participate in scientific conferences (find external travel funding, as needed)

Appendix I

Graduate Student Rights

- An academic environment that is free from intimidation, humiliation, and harassment
- Working within the number of hours appropriate for your appointed position
 - The standard 50% assistantship requires an average of 20 hours of work per week at the discretion of the faculty advisor when school is in session (U.S. Department of Homeland Security, UMN Graduate Assistant Employment Policy - policy.umn.edu/hr/gradstudentemployment and policy.umn.edu/hr/gradstudentemployment-appg). This work requirement is in addition to time spent on coursework and/or thesis work.
- Timely review and return of manuscripts and thesis drafts (i.e., 30 days)
- Paid and unpaid leaves (i.e. parental, holiday, sick, bereavement, military, court appearance, jury duty, voting) (Policy: http://policy.umn.edu/sites/policy.umn.edu/files/appendix/gradstudentemployment_appf.pdf)
- Leave of absence in emergency situations (Policy: <http://policy.umn.edu/education/gradstudentleave>)
- Reasonable religious and disability accommodations (Policies: <http://policy.umn.edu/hr/religiousholidays> and <http://regents.umn.edu/sites/regents.umn.edu/files/policies/DisabilityServices.pdf>)
- Completion of an agreed upon CFANS Scholarly Work Agreement, to resolve issues with regard to research or academic performance
- Assistance when dealing with difficult situations, without concern for retaliation or punishment

Additional Help for Students

Use available resources if you have concerns about your academics, faculty advisor, or work environment. Do not wait to seek help. In case of an emergency, call 911 or UMN Police (612-624-2677).

- Speak to your faculty advisor first if you are comfortable doing so; address problems directly and honestly. – To discuss a matter confidentially, please contact the Student Conflict Resolution Center.
- When you feel it is inappropriate to contact your faculty advisor, consult your Director of Graduate Studies (DGS), Program Level Coordinator (PLC), College Coordinator, or the Student Conflict Resolution Center for assistance. Use your best judgment in deciding which course of action is right for you.
- International students should also consult with International Student and Scholar Services when dealing with conflicts or concerns

Learning Outcomes of the Animal Sciences Graduate Program

Learning Goals (Core Competencies)	Instruction/Learning Experiences to Achieve Outcomes	Assessment Methods
1. Competency in Animal Sciences research and scholarly methods		
a. Advanced knowledge of the animal science disciplinary core in the main priority areas: <i>nutrition, physiology and growth biology; genetics, behavior and wellness, and production systems.</i>	<ul style="list-style-type: none"> • Core activities in coursework designed for the individual student (lecture/discussion) and assignments (research papers, oral presentations, literature reviews, research proposal, research article critique) • Courses in other departments that complement core activities (e.g. STAT 5012: Statistical Analysis) 	<ul style="list-style-type: none"> • Short answer and essay exams • Graded assignments, research papers, presentations, literature reviews, research proposals, critiques • Written Preliminary Exam (Ph.D.) • Oral Preliminary Exam or Oral Thesis (M.S.) • Proposal Presentation and Defense (Ph.D.)
b. Creation of knowledge and development of research skills in a specific research area	<ul style="list-style-type: none"> • ANSC 5091 - Research Proposals: From Ideas to Strategic Plans (Elective) • Plan B: M.S. project/paper; Plan A: M.S. research project (s)/thesis; Ph.D. research project (s)/dissertation. 	<ul style="list-style-type: none"> • Annual Progress Review • Applications for grants and fellowships • Oral Preliminary exam (Ph.D.) Final oral exam (M.S., Ph.D.)

Learning Goals (Core Competencies)	Instruction/Learning Experiences to Achieve Outcomes	Assessment Methods
2. Professional responsibility		
a. Ability to conduct research and scholarship in an ethical and responsible manner	<ul style="list-style-type: none"> • Ethics course required for all graduate students (see Ethics Requirement, pg. 20) • IACUC Animal Care and Use training modules. • ANSC 8510 - Graduate Seminar 	<ul style="list-style-type: none"> • Successful completion of ethics course • Evaluation by peers and faculty
b. Awareness of societal implications and practical application of research	<ul style="list-style-type: none"> • Thesis/dissertation research project • Presentations at professional meetings, interaction with users (scientists, producers, feed companies, etc.) • CFANS mentor program • Participation in seminars and workshops organized by other departments, colleges and/or industry. • Internships (first year students) 	<ul style="list-style-type: none"> • Final oral exam (M.S, Ph.D.) based on Plan A. M.S. research project/thesis; Plan B. M.S. project/paper; and Ph.D. research project/dissertation • Feedback from Mentor
c. International and global awareness of science, agricultural technology and agribusiness.	<ul style="list-style-type: none"> • Travel and international collaborative research. • Participation in international research and professional meetings. 	<ul style="list-style-type: none"> • Feedback from Principal Investigator of research project and/or laboratory work • Research proposals, publications, and co- advised projects

Appendix II

Learning Goals (Core Competencies)	Instruction/Learning Experiences to Achieve Outcomes	Assessment Methods
4. Communication		
a. Advanced written and oral communication skills	<ul style="list-style-type: none"> • ANSC 5091 - Research Proposals: From Ideas to Strategic Plans (Elective) • ANSC 8330 - Concepts and Developments in Animal Nutrition (Elective) • ANSC 8510 - Graduate Seminar (Required) • Writing thesis/dissertation and research articles • Society Meetings abstracts, poster or oral presentation • Drafting papers, preparing publications 	<ul style="list-style-type: none"> • Course grade based on participation and development of a research hypothesis • Evaluations by peers and faculty • Grade for graduate student seminar presentation • Annual Progress Review • Grants and fellowships applications • Publications

<p>b. Ability to communicate to broad audiences including experts, educators, media and the public, educationally and culturally diverse</p>	<ul style="list-style-type: none"> • Conference proceedings and presentations (local, regional or national) • Society Meetings abstracts, poster and oral presentations • Extension articles and presentations Lab group presentations • ANSC 8510 - Graduate Seminar • Providing tours of on-campus (dairy facilities, meat lab, forage tours, etc.) for industry members, elementary and middle school students from within the Twin Cities • Participation in public meetings/hearings 	<ul style="list-style-type: none"> • Annual Progress Review • Evaluation of Graduate Student Seminar presentation • Competition at regional and national meetings • Evaluation forms submitted by participants after the tour
<p>c. Instructional competency, teaching, and presentation skills</p>	<ul style="list-style-type: none"> • ANSC 8330 - Concepts and Developments in Animal Nutrition (Elective) • ANSC 8510 - Graduate Seminar (Required) • Teaching Assistant Experience • Guest lectures in departmental courses • Attendance and participation in courses and workshops organized by external (i.e. innovation in teaching workshop) and University's (i.e. the Center for Teaching and Learning) organizations 	<ul style="list-style-type: none"> • Evaluations by peers and faculty • Instructor feedback to TA and guest lecturers

Appendix II

Learning Goals (Core Competencies)	Instruction/Learning Experiences to Achieve Outcomes	Assessment Methods
5. Leadership and collaborative skills		
a. Integrative skills and experience in cross disciplinary team collaboration and problem solving	<ul style="list-style-type: none"> • ANSC 8510 - Graduate Seminar • Research project management and laboratory management • Participation in student associations and clubs • External departmental collaboration 	<ul style="list-style-type: none"> • Evaluations by peers and faculty • Annual Progress Review • Feedback from Principal Investigator of research project and/or laboratory work • Research proposals, publications as contributing or first author

<p>b. Leadership experience</p>	<ul style="list-style-type: none"> • Leadership and participation in journal clubs • Participation in recruitment of new faculty • Leadership and participation in Animal Sciences Graduate Club • Formal opportunities as representatives to faculty and student groups in the Department or CFANS • Informal opportunities within a research laboratory group, or with other Graduate Students, such as mentoring of new graduate students or undergraduate students • Participation in student and professional associations and clubs 	<ul style="list-style-type: none"> • Representation and/or attendance at faculty and/or student group meetings • Evaluation form submitted • Member of executive board • Competition at regional and national meetings, animal judging, other relevant events • Annual Progress Review
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Student Learning Outcomes for the Animal Sciences Graduate Program

Process for Developing Learning Goals

Learning goals, experiences and assessments for the Animal Sciences Graduate Program were developed by the Director of Graduate Studies. The Animal Sciences Graduate Studies Committee revised the document and distributed it to all Graduate Faculty and Students in the program. Feedback received from Graduate Faculty was incorporated into the document, followed by an open meeting with Graduate Students. Based on the discussion, this statement was written and sent out for a vote by Graduate Faculty and Students which voted unanimously to approve this document along with the attachment. These documents will be reviewed and updated as necessary every three years.

Goals of the Animal Sciences Graduate Program

1. *Competency in the Animal Sciences discipline, research and scholarly methods*
 - a. Advanced knowledge of the animal sciences disciplinary core in the main priority areas: nutrition, physiology and growth biology; genetics, behavior and wellness, and production systems
 - b. Creation of knowledge and development of research skills in a specific research area
2. *Professional responsibility*
 - a. Ability to conduct research and scholarship in an ethical and responsible manner
 - b. Awareness of societal implications and practical application of research
 - c. International and global awareness of science, agricultural technology and agribusiness
3. *Personal and professional management skills*
 - a. Management skills
 - b. Being self-motivated and autonomous
 - c. Ability to manage research projects and scholarship
4. *Communication*
 - a. Advanced written and oral communication skills
 - b. Ability to communicate to broad audiences including experts, educators, media and the public, educationally and culturally
 - c. Instructional competency/teaching/presentation skills
5. *Leadership and collaborative skills*
 - a. Integrative skills and experience in cross-disciplinary team collaboration and problem-solving
 - b. Leadership experience

Instruction/Learning Experiences to Achieve Outcomes

The Animal Sciences Graduate Program is highly diverse because of the combinations of areas of study in the discipline and animal species. The instruction/learning experiences in this document are generalizations/suggestions that may not apply to all Animal Sciences Graduate Students and adequate experiences should be determined for each student.

- 1 a.
 - Core activities in coursework designed for the individual student (lecture/discussion) and assignments (research papers, oral presentations, literature reviews, research proposal, research article critique)
 - Courses in other departments that complement core activities (e.g. STAT 5012: Statistical Analysis)
- b.
 - ANSC 5091 - Research Proposals: From Ideas to Strategic Plans (Elective.)
 - Plan B: M.S. project/paper; Plan A: M.S. research project(s)/thesis; Ph.D. research project(s)/dissertation
- 2 a.
 - Ethics course taken
 - IACUC Animal Care and Use training modules
 - ANSC 8510 - Graduate Seminar
- b.
 - Thesis/dissertation research project.
 - Presentations at professional meetings, interaction with users (scientists, producers, feed companies, etc.)
 - CFANS mentor program
 - Participation in seminars and workshops organized by other departments, colleges and/or industry
 - Internships (first year students)
- c.
 - Travel and international collaborative research
 - Participation in international research and professional meetings
- 3 a.
 - Participation in recruitment of graduate students
 - Member on search committee for new faculty positions
 - Participation in meetings of graduate students with prospective faculty members
 - Participation in student and professional associations and clubs
- b.
 - Thesis/dissertation research and responsibilities as a Teaching Assistant
- c.
 - Thesis/dissertation research
 - Drafting research reports (papers and project reports)
- 4 a.
 - ANSC 5091 - Research Proposals: From Ideas to Strategic Plans (Elective)
 - ANSC 8330 - Concepts and Developments in Animal Nutrition (Elective)
 - ANSC 8510 - Graduate Seminar (Required)

- Writing thesis/dissertation and research articles
 - Society Meetings abstracts, poster or oral presentation
- b.
- Conference proceedings and presentations (local, regional or national)
 - Society Meetings abstracts, poster and oral presentations
 - Extension articles and presentations
 - Lab group presentations
 - ANSC 8510 - Graduate Seminar
 - Providing tours of on-campus (dairy facilities, meat lab, forage tours, etc.) for industry members, elementary and middle school students from within the Twin Cities
 - Participation in public meetings/hearings
- c.
- ANSC 8330 - Concepts and Developments in Animal Nutrition (Elective)
 - ANSC 8510 - Graduate Seminar (Required)
 - Teaching Assistant Experience
 - Guest lectures in departmental courses
 - Attendance and participation in courses and workshops organized by external (i.e. innovation in teaching workshop) and University (i.e. the Center for Teaching and Learning) organizations
- 5 a.
- ANSC 8510 - Graduate Seminar
 - Research project management
 - Laboratory management
 - Participation in student associations and clubs
 - External departmental collaboration
- b.
- Leadership and participation in journal clubs
 - Participation in recruitment of new faculty
 - Leadership and participation in Animal Sciences Graduate Club
 - Formal opportunities as representatives to faculty and student groups in the Department or CFANS
 - Informal opportunities within a research laboratory group, or with other Graduate Students, such as mentoring of new graduate students or undergraduate students
 - Participation in student and professional associations and clubs

Assessment Methods

There are various metrics that will be utilized to assess achievement of student learning goals and outcomes (see attached). The Animal Sciences Graduate Program has an annual review process where students and advisers individually meet to discuss progress, complete an annual report, and then develop a plan towards making progress in the upcoming year. After this discussion, students will also meet with the Director of Graduate Studies to assess progress and concerns.