

ANIMAL SCIENCE GRADUATE STUDENT HANDBOOK

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Introduction

Each graduate student must understand at the outset that a high-quality graduate education is very much dependent upon strong commitment, resourcefulness and high standards of achievement. In a sense, a student's major professor, graduate advisory committee, coursework and research problem serve simply to facilitate graduate education. As such, students should set for themselves a standard of excellence, make as much use of the aforementioned available "facilitators" as is possible and, in so doing, make the most of their graduate education. The student must be mindful that the material delineated in this handbook describes the minimum requirements as established by the University of Tennessee Graduate School and Department of Animal Science. Meeting these minima will not, however, necessarily constitute a high quality graduate education. The onus of responsibility for this rests firmly upon the student.

The Graduate Program in the Department of Animal Science, The University of Tennessee, Knoxville

Goals. The graduate program in the Department of Animal Science is dedicated to training graduate students in the multiple disciplines associated with the animal sciences. Basic to the program is the development of appreciation in students of the depth and breadth of knowledge available in the disciplines of nutrition, physiology, genetics, animal health and well-being, and reproduction and to further develop an awareness of the use of the scientific method in the investigation of fundamental problems associated with animal production. The goal of the graduate program is to train students to be well qualified to compete for the diverse job opportunities available within the student's major interest area. This requires a mixture of general training and specific training adapted to the individual student's needs and desires. Because animal science involves a combination of many allied disciplines, including chemistry, biochemistry, biology, microbiology, genetics, and statistics, the types of programs available to students are flexible but of equally high quality regardless of the direction of effort. Thus, programs rely on selection of a combination of courses in allied sciences, together with courses in the animal science area itself. This, together with the planning, conduct, interpretation and reporting of an original research project, constitutes the general design of any individual graduate program.

Purpose of Handbook. The policies and procedures outlined in this manual are intended to serve both the faculty and graduate students in carrying out the details of organizing and conducting a successful graduate program.

Graduate Programs

The Department of Animal Science offers graduate programs leading to the Master of Science and Doctor of Philosophy with a major in animal science. Areas of emphasis are animal genetics, nutrition, health and well-being, physiology, and reproduction with orientation towards agriculturally important animal species.

All first- and second-year Master of Science students are required to enroll in 596 each spring term and all first- and second-year Doctor of Philosophy students are required to enroll in 696 each spring term.

The Master of Science Program

The program requires the writing of a thesis based on original research; the completion of a minimum of 24 hours of graduate coursework, of which at least 14 hours must be taken in courses numbered at or above the 500 level; and six hours of thesis. Included in the course requirement are one hour of Agriculture and Natural Resources 512 and a minimum of three hours in statistics. Statistics courses must be chosen from the 500 or 600 level courses approved for use in the Intercollegiate Graduate Statistical Program (ICGSP). The remainder of coursework will be selected jointly by the student and the major professor depending on the student's area of emphasis and professional objectives.

The advisory committee will consist of the major professor, a faculty member of Animal Science, who will act as chairperson of the committee, and a minimum of two other faculty members, one of whom may be outside of the Animal Science Department. The advisory committee approves the student's coursework and research problem, and conducts the final oral examination which consists of a comprehensive oral examination and a defense of the thesis.

The Doctor of Philosophy Program

The doctoral program requires a minimum of 48 hours of coursework beyond the Bachelor of Science and a minimum of 24 hours of doctoral research and dissertation. The 48 hours of coursework must include

- A minimum of 16 hours in related fields outside of animal science.
- At least 24 hours credit at the 500- and 600-level, exclusive of doctoral research and dissertation, of which a minimum of 6 hours must be at the 600-level.
- A minimum of 1 hour of Agriculture and Natural Resources 512 in addition to that required at the Master of Science level.
- A minimum of 6 hours of 500- or 600-level statistics courses approved for the ICGSP.

A minimum of five faculty members will constitute the student's advisory committee, of which at least one must be outside animal science. The major professor will be the chairperson. The student and major professor select the program of study depending on the student's area of emphasis and professional goal. The advisory committee approves

the program of study and dissertation research proposal, and conducts the comprehensive written and oral examination and final dissertation defense examination.

Degree Status, Major Professor and Faculty Advisory Committee

Non-Degree Status. Admission to the M.S. program requires a 3.0 grade-point average on a 4.0 scale (or a 3.0 each term during the junior and senior years) in a completed undergraduate degree program in one of the animal sciences or in a related area. Students who meet the minimum requirements of the Graduate School but 1) have less than a 3.0 GPA, 2) are deficient in certain prerequisite courses, or 3) are entering from another undergraduate major may request admission as a non-degree student. While in the non-degree status, the student shall be advised by the department's graduate coordinator. Before enrolling in the first semester, a program of study shall be established by the graduate coordinator after evaluation of the student's academic transcript, and after consultation with members of the graduate committee in the discipline(s) of the student's interest. The program of study will usually consist of 9 to 12 graduate credit hours, but may also include some prerequisite courses for undergraduate credit. The student must complete this program during the first semester of matriculation with a GPA of 3.0 or above. Dropping of assigned classes is not permitted. Upon successful completion of the program, the student may apply for admission as a M.S. degree candidate.

M.S. Degree. Following acceptance of a student into the M.S. degree program, a major professor (graduate advisor) and faculty advisory committee will be appointed for the student. This appointment is made by the department head after consultation between the student and the prospective major professor. The major professor should be appointed before or during the first semester of matriculation (enrollment) and the advisory committee no later than during the second semester of matriculation. The advisor will be the individual who directs the student's research and thesis program. In rare cases, a temporary advisor may be appointed until the permanent advisor can be appointed.

For the M.S. degree program, the advisory committee will consist of the student's major professor, plus at least two additional faculty members with a teaching appointment. Graduate committee members may be from within the department, but participation by members of other departments is permissible and encouraged if the situation dictates.

Ph.D. Degree. The student's doctoral committee should be officially appointed no later than during the third semester of matriculation. This requires submission of the Doctoral Committee Appointment form to the Graduate School (<http://registrar.utk.edu/graduation/graduate/forms/doccomappointinteractive.pdf>). The committee will consist of a minimum of five members of the graduate faculty, at least three of whom must be approved for directing doctoral research and at least one of which must be from outside the Department of Animal Science.

Program of Study

The graduate student, the major professor, and the advisory committee are co-responsible for designing a program of study for the student. This program should consist of the list of courses tentatively scheduled that will allow the student to meet departmental and university requirements for the respective degree. It is recommended that the program of study be established and approved by the student's major professor and advisory committee members no later than during the second term of matriculation.

Admission to Candidacy

Admission to candidacy reflects agreement among the student, graduate committee, and The Graduate School that the student has demonstrated ability to do acceptable graduate work and that normal progress has been made toward a degree. This action usually connotes that all prerequisites to admission have been completed and a program of study has been approved.

Master's degree students should submit an Admission to Candidacy form (<http://registrar.tennessee.edu/graduation/graduate/forms/macandinteractive.pdf>) following completion of their coursework with at least a B average, but no later than one full semester prior to planned degree completion.

Doctoral degree students may be admitted to candidacy after passing the comprehensive examination, and maintaining at least a B average in all graduate coursework. Each student is responsible for filing the Admission to Candidacy form (<http://registrar.tennessee.edu/graduation/graduate/forms/doccandinteractive.pdf>). On this form list all courses to be used for the degree, including courses taken at UTK or at another institution prior to admission to the doctoral program. Admission to candidacy must be applied for and approved by The Graduate School at least one full semester prior to the date the degree is to be conferred.

Research and Thesis or Dissertation

All graduate programs in the Department of Animal Science involve fulfilling the requirement for the conduct of a research program and the writing of an approved thesis or dissertation prior to the final examination, either for the M.S. or Ph.D. degree. The general rules of the University of Tennessee Graduate School and the specific requirements of the Animal Science Department pertaining to the allowable number of hours, format, and so forth will be followed.

Selection of Research Problem. It is the responsibility of the major professor, in consultation with the graduate student, to select a proper research problem early in the program for the particular degree. The general problem should be selected no later than the second semester of the M.S. student's program, and no later than the fourth semester of the doctoral student's program.

Although the research program conducted by the student will usually relate to the overall research program which is under the direction of the student's advisor, the

initiation, conduct, and use of research on original ideas by the student will be encouraged when possible. It should be remembered, however, that most of the funds which support the graduate research programs are derived from the Experiment Station and extramural grants that impose certain responsibilities on the department.

Research Proposal. The M.S. student shall submit to his/her major professor and advisory committee members a research project proposal during the second semester of matriculation. The Ph.D. student must submit to his/her major professor and advisory committee a research project proposal no later than the fourth semester of matriculation in the Ph.D. program. Both M.S. and Ph.D. research proposals should consist of a literature review, statement of objectives, proposed procedures and methods (including experimental designs), proposed statistical analysis techniques, and literature cited section. It is recommended that proposals are written in a format similar to the "Project Description" section of the USDA Competitive Grant Application.

Thesis/Dissertation Registration

The M.S. degree requires a minimum of six hours of course 500 including three hours the semester in which the thesis is accepted by the Graduate School. The Ph.D. degree requires 24 hours of course 600 and the student must register continuously (minimum of 3 hours) from the time the doctoral research proposal is approved, admission to candidacy is accepted or registration for course 600 is begun, whichever comes first. It is advised that registration for course 500 or 600 not exceed the requirement since fees are assessed per credit hour.

A student who will not be using faculty services and/or university facilities for a period of time may request leaves of absence from dissertation research up to a maximum of six terms (including summer terms). The request, to be made in advance, will be considered by The Graduate School upon written recommendation of the department head.

Research Should Be Publishable. Although it is difficult to set general standards for research programs for either the M.S. or Ph.D. degree, high quality should be maintained in all cases. It is incumbent upon the graduate advisors and advisory committees to ensure that the research program selected for any given student is a high-quality program deserving of the awarding of credit for research and thesis in fulfillment of the requirements for the degree. As a guideline, an M.S. thesis should result in the production of at least one publishable paper, whereas a Ph.D. dissertation should result in two or more publications. It is in the student's and department's best interest to publish all research results with minimum delay. Therefore, manuscripts emanating from thesis or dissertation research shall be submitted to the student's advisory committee before or at the time the completed thesis/dissertation is submitted.

Ph.D. Dissertation Format. Graduate School rules regarding margins, footnotes, paper, etc., must be followed. In addition to these rules, students are required to write their dissertation in a scientific journal format. Typically, a dissertation so written would consist of the literature review with references; additional chapters which would each constitute a manuscript (i.e., title, abstract, introduction, materials and methods, results, discussion, and references); the final chapter, which is the general discussion, which may contain results deemed not to be published; and any appendices and the vita

Final Examination for Thesis and Dissertation

An M.S. candidate must pass a final comprehensive oral examination on all work offered for the degree. A Ph.D. candidate must pass a dissertation defense and this must be scheduled through the Graduate School (http://registrar.utk.edu/graduation/graduate/forms/arg_defence.pdf). Note that every degree candidate is expected to present a departmental seminar on her/his research immediately before the examination. This seminar is open to all faculty, staff and students and it is the responsibility of the student and advisor to publicize and announce the seminar at least one week in advance.

The final draft of the thesis/dissertation must be distributed to all committee members at least two weeks prior to the date of the final examination.

Failure to Complete Thesis or Dissertation. All graduate students must be cognizant of the fact that, although an individual student necessarily invests considerable amounts of talent, time and effort in an M.S. or Ph. D. research project, the Institute of Agriculture also has a significant financial interest in any research conducted in the department. In fact, the legal ownership of any research in the department is vested in The University of Tennessee Institute of Agriculture and is under the control of the project leader (usually the student's major professor). The costs of all materials and supplies, animals, salaries of farm and technical personnel, etc. are underwritten by the Institute of Agriculture. Since the ultimate goal of any research is publication of results, the policy of the department must be to require that all research conducted by graduate students be published within a reasonable length of time after the research is completed. The length of time deemed reasonable will, of course, vary with the nature of the research, and any extenuating circumstances will be considered. If the project leader (usually the graduate student's major professor) determines that the student has failed to write up the research results in thesis or dissertation form in a reasonable length of time (usually about six months after obtaining the results), the major professor will proceed to prepare a scientific manuscript for publication, following notification of the student. This would naturally preclude use of the data for a M.S. thesis or Ph.D. dissertation.

Time Limits

M.S. candidates have six calendar years from the time of enrollment in the Graduate School to complete the degree. Ph.D. candidates must complete comprehensive examinations within five years, and all requirements must be completed within eight years from the time of a student's first enrollment in a doctoral program.

Publication Policy. Authorship resulting from research programs is a measure of recognition for the individuals who made substantive contributions to the research effort. Responsibility for establishing the order of authorship for any article rests with the project leader.

Several factors should be considered in determining authorship. Major considerations are related to the conception of the problem, development of the research plan, collection of data, analysis of data and formulation of the conclusions. After these steps

have been taken, the paper must be written. Authorship should be established by determining the specific contribution each person made in the conduct of the research. Those who made significant inputs in the planning, execution and evaluation of the research should be considered for authorship. People who performed routine functions such as data collection and data analysis should not be awarded authorship.

The subject of authorship should not be taken lightly by the project leader and should reflect as accurately as possible the relative contributions of those involved. A delicate balance must be established between including those whose contribution was marginal and in excluding someone whose contribution was significant. Likewise, the inclusion of the name of a marginal contributor could dilute the importance of the other designated authors.

Other types of recognition can be given to contributors who do not warrant author status. Acknowledgements and footnotes are proper ways to recognize these types of efforts. Of course, many people who may contribute to the success of the research effort and the completed manuscript are never recognized because of the nature of their work assignments. Since so many different people with different skills are usually associated with the conduct of any experiment, it becomes an impossible task to attempt to recognize all who made contributions through authorship.

Teaching Internships

Requirement for Graduate Degrees. An opportunity is provided for students to obtain teaching experience in the form of a program entitled "*Teaching Internships.*" This course is designated as ANR 512 and carries one academic credit hour for each semester's participation. M.S. students are required to participate for at least one semester during their degree program, and Ph.D. students are required to participate for an additional semester during their program. No more than two credit hours will be allowed in either the M.S. or the Ph.D. program for this participation (four total hours possible in a Ph.D. program). Students on 1/2-time graduate teaching assistantships or with the rank of instructor may use their teaching assignments to satisfy this requirement.

Registration for Teaching Internship. The student internship program is coordinated by the department head and the dean of the College of Agriculture. The student, with the major professor's consent, selects a specific course prior to the semester in which enrollment occurs. Then, permission of the instructor(s) of the course must be obtained. Registration for the course must be with a drop-and-add form and permission obtained from the dean. The student is responsible for attending the classes in that course for that semester, observing the instructor during his/her presentations, and for preparing and presenting one lecture and/or one laboratory demonstration during the course of the semester. Following the student's presentation, the instructor will critique the student in an effort to improve the student's teaching ability. It should be borne in mind that the objective of this program is not to provide assistance to the instructor in the menial tasks of teaching a course, such as excessive grading of papers, but is to give the student experience in various phases of the teaching activity. Obviously, to obtain this experience the student must participate in the various activities of the course which may include writing test questions about their own presentations and grading the

answers to those questions. It may also involve weekly assistance in setting up laboratories, but is not designed to replace teaching assistants.

Part-Time Employment Opportunities

A limited number of opportunities are available for students in the form of part-time employment while pursuing the M.S. or Ph.D. degree. These opportunities are in the form of teaching assistantships, research assistantships, and biweekly payroll assignments.

Assistantships are awarded only to students who have exhibited a high level of scholarly achievement. This is done to ensure that the student can complete a rigorous and high-quality graduate program while carrying out the responsibilities inherent to an assistantship. Assistantships differ from scholarships or fellowships, which are awarded solely based on merit and are designed to promote academic excellence. Students who receive assistantships or biweekly payroll assignments are expected to exhibit the same degree of commitment, responsibility, and accountability as any other staff member employed by the University. Continuation of part-time employment shall be contingent upon adequate progress in the respective degree program and maintenance of a GPA of at least 3.0/4.0.

Graduate Teaching Assistantships. Graduate Teaching Assistants work under the direct supervision of a regular faculty member in activities such as helping to prepare lectures, teaching discussion sections, conducting laboratory exercises, grading papers and keeping class records. Appointments are normally on a one-fourth to one-half time basis.

Graduate Research Assistantships. GRA's at the M.S. and Ph.D. levels are considered 1/2-time assistantships. However, it is generally considered that when GRA's are not in class, they will be at work and be available for assistance to their major professor. The graduate research assistantship is not considered on an hourly rate but is merely a stipend to qualified students to further the department's research program. They are not to be considered only as paid time for the student's thesis or dissertation project.

Bi-weekly Payroll Assignments. A number of graduate students have been hired on a part-time basis to assist in teaching and research operations. These students are paid on an hourly basis and generally have more freedom as to the time for performing their duties.

Fellowships. There are a number of fellowships supplied by the University which are not directly related to the Department of Animal Science but for which students in the Department are eligible. These fellowship opportunities can be viewed at <http://gradstudies.utk.edu/gradfund.shtml> .

General Nature of Graduate Programs

Professionalism. The graduate student must learn immediately that the purpose of graduate training is to develop a considerably higher degree of professionalism. Whereas an undergraduate is trained as a generalist, the graduate student is trained as a specialist. The earning of a graduate degree carries with it an understanding that the individual has achieved a certain level of professional competence. Thus, the graduate program must be designed to accomplish this.

Time Required for Graduate Study. Time required for a graduate program varies with the nature of the research program, previous preparation of the student and the student's individual ambition or industry. Normally, an M.S. degree cannot be earned in less than 1-1/2 years (2 years with graduate research assistantship) while a Ph.D. requires 2-1/2 or 3 years beyond the M.S. degree. Students willing to devote more hours per day to their tasks will generally finish earlier.

Involvement in Departmental Functions. Graduate students should take advantage of every possible opportunity to improve their professional abilities. This includes not only formal coursework, but all department and institutional seminars available. However, the greatest learning experiences may be through exercising an intensely inquisitive mind by reading current literature in the field, informal discussions with staff and graduate students, attendance at scientific meetings and participation in many other functions of the department. Indeed, much can be learned in classic discussion with fellow graduate students. Students unwilling to participate in these will miss much in their program and may take longer to earn the degree.

Membership in Professional Organizations. Membership in professional organizations, such as American Society of Animal Science, American Dairy Science Association, and Poultry Science Association, is highly encouraged. Many societies have "associate" or "student affiliate" memberships for graduate students at reduced cost. Remember you are training for a profession and should begin to direct your interests accordingly.

Use of Department Facilities

Desks and Keys. Attempts will be made to provide students a desk when possible and office/desk assignments will be made according to the following priority:

1. Students on assistantship.
2. Students not on assistantship, but working on their research problems.
3. Others.

Assignments will be made to allow for maximum exposure to other graduate students, especially within disciplines. If a student does not intend to utilize this desk space fully, he/she should notify the department head so the space may be assigned to another student.

Graduate students may be issued keys to those Animal Science facilities deemed appropriate by the department head. Requests may be submitted via the principal secretary to the department head. Only keys obtained by this procedure are authorized to be in the possession of the graduate student. Those who have unauthorized keys in their possession run the risk of dismissal from the program.

Routine Office Supplies. The department will provide the normal supplies needed by GRA's or GTA's in the execution of their assistantship duties. These will include secretarial support when the materials are channeled through the major professor or faculty member in charge of the course. (Teaching internship activity will also be supported when processed through the faculty member in charge of the course.)

The department does not provide supplies for the student to use in academic coursework.

Wearing Apparel. The department will provide appropriate specialized materials such as surgical wear or protective laboratory apparel required in the execution of GRA or GTA duties. The department will not, however, provide apparel for routine activities, e.g., coveralls.

Thesis Materials. The department of Animal Science will provide materials needed in the execution of the research program approved by the student's graduate committee and department head. The typing of theses or dissertations is the student's responsibility as are paper and duplication charges.

Materials for Presentation of Research at Professional Meetings. Posters utilized in presenting research data at professional meetings will be provided via the major professor's research program funding, with approval. Likewise, preparation of figures, publication page charges, etc. incurred as a result of publishing thesis research will be provided via the major professor's research program, with approval.

Departmental Trucks. Graduate students should have on file an approval sheet before operating departmental trucks. Regulations for signing out and operating trucks should be observed at all times.

Computers. The department has a number of PC's available for graduate students, but use must be in accordance with University regulations which prohibit use of unauthorized software, tampering with computer files/programs which belong to others, etc. The Department provides adequate software, and therefore reserves the right to check for and erase all unauthorized software.

Statement on Graduate Students Rights and Responsibilities.

This statement covers rights and responsibilities which are peculiar to graduate students and which may not be mentioned in the graduate catalog. Those rights and responsibilities which are viewed as more general and applying to all students, both graduate and undergraduate, are discussed in *Hilltopics* (<http://web.utk.edu/~homepage/hilltopics/>).

Right to Learn. The University of Tennessee has a three-fold purpose: Instruction, Research, and Public Service. All of these are of concern to graduate students, who are necessary components in carrying out each of the three purposes. No student has the right to interfere with the learning process, another's research, or a public service program (as determined by the University).

Code of Professional and Academic Standards. The graduate student has the right to be informed concerning departmental, professional and academic policies and procedures that affect the student. The student should be informed of these during the initial semester in which he/she enrolls in a specific program. It is the responsibility of the student to familiarize himself/herself with departmental program, collegiate policies and procedures and to ask questions if the information is not clear or if it is not provided.

Change of Degree Requirements. Normally, graduate students have the right to be evaluated according to the requirements of the program under which they entered. However, departments/colleges have the right to change program requirements and apply them to students already admitted provided adequate notice is given and the requirements are not made retroactive to parts of the program already completed by the student. They may expect to receive periodic assessments of their progress as determined by the major program/department.

Retention Standards. Graduate education requires continuous evaluation of the student. This evaluation includes not only periodic objective evaluations, such as the cumulative grade-point average, performance on comprehensive examinations and acceptance of the thesis or dissertations, but also judgments by the faculty of the student's progress and potential. Continuation in a program is determined by consideration of all these points by the faculty and the head of the academic unit.

The academic records of all graduate students are reviewed at the end of each semester, including the summer term. Graduate students must maintain a cumulative grade-point average (GPA) of at least 3.0 in all graduate courses taken for a letter grade of A-F. Grades of S/NC, P/NP, and I, which have not numerical equivalent, are excluded from this computation. These policies do not apply to provisional students.

Academic Probation. Upon completion of nine hours of graduate coursework, a graduate student will be placed on academic probation when his or her cumulative GPA falls below 3.0. A student will be allowed to continue graduate study in subsequent semesters if each semester's grade point average is 3.0 or greater. Upon achieving a cumulative GPA of 3.0, the student will be removed from probationary status.

Dismissal. If a student earns <3.0 semester GPA while on academic probation, they will be terminated by the department unless the particular circumstances are deemed to justify continuation on a semester by semester basis.

Dismissal of a graduate student by the department is accomplished by written notice to the student, with a copy to The Graduate School.

Right to a Major Professor and Advisory Committee. After meeting conditions stipulated by his/her department or program, a student has the right to a major professor and a committee. The student should be involved in the selection of the persons to serve.

Academic Programs are Decided by the Faculty. The rights of making policies for academic programs is vested with the faculty. Students may be expected to contribute in the decision through invited participation in committee efforts, or through contributions of their own initiative.

Confidentiality of Records. Certain records are confidential. Information concerning confidentialities may be found in the current edition of *Hilltopics*.

Academic Integrity. University guidelines concerning "Student Academic Conduct" are found in the current edition of *Hilltopics*

<http://web.utk.edu/~homepage/hilltopics/HILLTOPICS2005-06.pdf>

Grievance Procedure. Normally grievances should be handled at the departmental level through the student's major professor or the department or program head. Further appeal may be made to the Dean of the Graduate School, then to the Graduate Council, and then to the Chancellor. Students should familiarize themselves with the Graduate Council Appeal Procedure found at

<http://gradstudies.utk.edu/GraduateCouncil/AcadPoli/appealprocedure.pdf>.