Animal & Comparative Biomedical Sciences Graduate Student Handbook

The University of Arizona –
College of Agriculture Life and Environmental Science
School of Animal and Comparative Biomedical Sciences

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Introduction

Welcome, Graduate Students, to the Animal and Comparative Biomedical Sciences (ACBS) Graduate Program!

We are looking forward to working with you through your graduate school journey. The handbook has been prepared to help you better understand the program and meet various requirements for completing your advanced degree. I recommend that you become familiar with the handbook and keep a digital or print copy somewhere you can easily access for reference. Your major advisor (Principal Investigator) will help you navigate through your degree, but it is your responsibility to keep an eye on your progress, due dates, and seek advice/guidance.

In addition to degree requirements and procedures, you will also find information about available resources, research training faculty profiles, and advice on how to choose a graduate committee. This handbook also includes the contact information of the Graduate Program Executive Committee and Graduate Coordinator.

Finally, while we have collated all the information pertinent to obtaining a degree in ACBS in this handbook for your convenience, it is important that I let you know that the University of Arizona Graduate College is the official listing of these procedures and requirements. You can access their website by visiting https://grad.arizona.edu.

We understand that getting your graduate degree is an exciting and somewhat challenging time. Please don't ever hesitate to reach out for help or assistance if you need it. Just like the graduate handbook, both myself, and the Graduate Coordinator are here to help you succeed and graduate with the most success possible. If you have any questions or face any problems, please do not hesitate to contact me, the Graduate Coordinator, or any member of the Graduate Program Executive Committee.

Best Wishes,

Kerry Cooper, PhD
Associate Professor
Director of Graduate Studies
Animal and Comparative Biomedical Sciences Graduate Program

Department Facilities

Campus

The School of Animal and Comparative Biomedical Sciences, home to the Animal & Comparative Biomedical Sciences Graduate Program, is in the Animal and Comparative Biomedical Sciences (ACBS) Building on the main campus of the University of Arizona. Laboratories are spread between the ACBS and Shantz buildings, Al-Marah Equine Center, Agriculture Research Complex, and Bio5 facility. These laboratory facilities provide modern equipment to support the research activities of the graduate faculty. Animal research units can be found in Tucson at the Campus Agricultural Center and West Campus Agricultural Center. Additional research units are also stationed near Camp Verde, AZ at the V-Bar-V Ranch.

Campus Ag Center

The Campus Agricultural Center houses several research and curriculum-enriching facilities. The Agriculture Research Complex is a state-of-the art facility for conducting large animal physiology and nutrition experiments under complete environmental control. The sophisticated environmental chambers, surgical suites, and associated laboratories make this the most sophisticated environmental research facility in the country. The Food Product and Safety Lab provides a USDA-inspected harvesting plant for research and instruction in meat science, food safety and new product development.

The Livestock Complex, which is a covered livestock arena, is used for equestrian instruction, the equestrian team and livestock judging events. This facility is also available for teaching or use by the Arizona Cooperative Extension Service, 4-H, Future Farmers of America (FFA), and outside groups. The Equine Unit is used for instruction and research in equine reproduction and management. Intensive research in nutrition, reproduction and physiology of ruminants is conducted in a 48-pen unit located at the west end of the Campus Agricultural Center.

V-Bar-V Ranch

The V Bar V Ranch is located in Rimrock, Arizona, approximately 220 miles north of Tucson. The University of Arizona- College of Agriculture, Life and Environmental Sciences acquired the V Bar V Ranch in January 1995 on a gift/purchase basis from Ben and Betsy Zink. The acquisition was made possible through the use of private funds provided by the college's supporters and the UA Foundation. Transecting the Mogollon Rim, the 71,000-acre grazing allotment runs about 30 miles east from Camp Verde and varies between four and five miles in width. Forty-four acres is private land, with the remainder held under lease from the U.S. Forest Service. With elevations ranging from 3,200 to 7,000 feet, the ranch allows the UA College of Agriculture, Life and Environmental Sciences to expand its experiment station network to include higher elevation ecosystems. In addition to 540 cattle, the ranch is also a habitat for a wide variety of wildlife, ranging from mammals, birds, and fish to reptiles and amphibians. Vegetation zones, including high desert chaparral, pinon-juniper woodland, and pine forest, are representative of most commercial ranches in Central and Northern Arizona. As the V Bar V is a fully operating, working ranch, applied research is the primary aim. Faculty, staff, and students can utilize the ranch to conduct research in animal and plant science, veterinary science, renewable natural resources, agricultural economics, soil and water science, and agricultural engineering.

Al-Marah Equine Center

The Al-Marah Equine Center is located in East Tucson nestled within the foothills of the Catalina Mountains. The University of Arizona- College of Agriculture, Life and Environmental Sciences acquired Al-Marah Equine Center thanks to a generous gift from Ruth “Bazy” Tankersley. The Al-Marah Equine Center is an 80-acre working equine ranch that allows for equine instruction, research, and community engagement.

2025-2026 Graduate Committee

Director of Graduate Studies:		
Kerry Cooper, Ph.D.	kcooper@arizona.edu	(520) 621-3342
Graduate Committee Members:		
Benjamin Renquist, Ph.D.	bjrenquist@arizona.edu	520-626-5793
Duarte Diaz, Ph.D.	duartediaz@arizona.edu	520-621-1221
Sean Limesand, Ph.D.	limesand@arizona.edu	520-626-8903
Chi Zhou, Ph.D.	chizhou@arizona.edu	520-621-2457

Faculty & Research Interests

Kerry Cooper (kcooper@arizona.edu or 520-621-3342) *Associate Professor – Ph.D., University of Arizona.*
The Cooper laboratory research focuses on utilizing different -omic tools, phenotype assays, and animal models to address the genomics, pathogenesis and epidemiology of various bacterial foodborne pathogens including *Campylobacter jejuni, Salmonella, Listeria, and* Shiga toxin-producing *Escherichia coli.* **Cooper Laboratory Research Focuses:** (1) Comparative genomics, transcriptomics, and epigenetics of various pathogenic bacteria, particularly Shiga toxin-producing *Escherichia coli* (STEC), *Campylobacter*, and *Salmonella*; (2) SNP analysis and developing other tools to improve source tracking of foodborne pathogens during outbreaks; (3) Studying the evolution of numerous bacterial foodborne pathogens in various agricultural environments; (4) Utilizing various -omics tools to identify host-specific genes, virulence genes, fitness genes and conserved genes; (5) Investigating the pathogenesis of *Campylobacter* and other foodborne pathogens; (6) Development and improvement of animal models for various bacteriological diseases, and innovation of effective vaccines against various bacteriological diseases; (7) Development of rapid and effective detection and surveillance techniques for foodborne pathogens; (8) Exploring the microbiomes and metagenomics of different agricultural environments, plants, and animals, and the impact foodborne pathogens have on these communities; (9) Role antibiotic resistant bacteria in various environments have on human health.

Zelieann Craig (zr.craig@arizona.edu or 520-621-8082) *Associate Professor – Ph.D., University of Arizona*.
Dr. Craig is interested in understanding how environmental chemicals affect the fertility of women and animals. Her work focuses on understanding how phthalates, a group of endocrine-disrupting chemicals, affect ovarian function. Thus, work in her laboratory is focused on using animal models to elucidate the mechanisms by which phthalates exert ovarian toxicity, determine whether phthalates cause female infertility, and examine whether the effects of phthalates on female reproduction can be prevented or reversed. Using this knowledge, she hopes to also develop additional models to evaluate other chemicals and environmental factors that could influence both human and animal reproduction.

Arun Dhar (adhar@arizona.edu or 520-621-8727) *Professor and Director, Aquaculture Pathology Lab (APL)- Ph.D., Indian Agricultural Research Institute, New Delhi, India.*

Diseases caused by viruses, bacteria and fungi are the largest threats to sustainable shrimp aquaculture worldwide. To address these threats, APL has multidisciplinary research programs. The key areas of research include: (1) identifying and characterizing etiologic agent associated with shrimp diseases, (2) developing novel diagnostic tools and improving existing methods to address emerging needs, (3) understanding the molecular basis of viral pathogenesis in RNA and DNA viruses that infect shrimp, and (4) developing anti-microbial therapies. The researchers in APL have used PCR-based methods as well as CRISPR-Cas-based method to develop diagnostic tools for infectious diseases in shrimp. Laser dissection microscopy coupled with genomic approaches are being used to identify novel and emerging pathogens, and to perform retrospective studies on pathogen evolution of aquatic organism. A reverse genetics approach is used to engineer infectious shrimp viruses in vitro and hence overcome the lack of immortal cell lines in crustaceans. This allows us to engineer viruses, study the function of viral encoded proteins and their role in viral pathogenesis. Finally, despite major progress in viral disease diagnostics, there are no anti-viral therapies commercially available against any of the viral diseases that threaten the sustainability of shrimp aquaculture. Dhar's lab is now using genome editing tools to develop therapy against viral diseases shrimp that can be potentially used at a commercial scale.

Duarte Diaz (duartediaz@arizona.edu or 520-621-2355) *Professor and Dairy Extension Specialist – Ph.D., NC State.*
For the past 15 years, Dr. Diaz has worked in academia at several institutions including Utah State University and the Catholic University of the Sacred Hearth in Italy. After several years working in the private sector, Dr. Diaz joined the faculty at the University of Arizona as an Associate Professor and Dairy Extension Specialist. His research interests include:

Nutritional Toxicology. Molds are ubiquitous in nature and as a result they are frequently found in agricultural commodities utilized as livestock feeds. These molds can produce harmful compounds called mycotoxins. To maximize livestock production, exposure to anti-nutritional factors, i.e., mycotoxins, should be minimized. Our efforts are geared to (1) better understand their occurrence in different feedstuffs particularly by understanding the relationship between molds, plants and the environmental conditions which often trigger their production, (2) increase the knowledge on the effects of these toxins on animal performance, particularly by studying their effects on immune response, gut health, oxidative stress and target organ damage, and (3) identity exposure biomarkers for the utilization as both clinical tools and for investigation of mitigation strategies.

Dairy Management. The state of Arizona ranks nationally as number twelve in total milk production, number two in average herd size, and in the top 3 in milk production per cow. Therefore, the nearly 100 dairy producers in the state average almost 2,000 high producing cows per farm. The management of operations of this size and complexity is an important part of their profitability. As the dairy extension specialist Dr. Diaz job is to provide relevant and current extension programs to the dairy producers of the state. This includes educational activities that are broad-based in nature, but specifically impact decision-making ability at the farm level. It also includes research and graduate programs that help answer relevant questions in the industry.

Sean Limesand (limesand@arizona.edu or 520-626-8903) *Professor- Ph.D. Colorado State.*
Research focuses on fetal development and growth, understanding how aberrant fetal nutrient and/or endocrine factors lead to postnatal complication or the fetal origins of adult diseases. Dr. Limesand seeks to identify mechanisms that alter pancreatic structure, physiology, and metabolism in intrauterine growth restricted offspring to provide treatment strategies.

Fiona McCarthy (fionamcc@arizona.edu or 520-626-2875) *Professor- Ph.D. The University of Queensland, Brisbane, Australia.*

Trained in molecular biology and virology, her current research interest focuses more on bioinformatics and genomics. She is a co-founder and current PI of AgBase, a database that provides functional annotation, tools and support for agricultural researchers dealing with large scale data sets that they wish to functionally model. As part of this work, they provide Gene Ontology (GO) data to the GO Consortium for several agricultural species, foremost amongst them chicken, cow, and cotton. Other bioinformatics, biocuration and genomics projects include providing standardized chicken gene nomenclature; investigating tissue specific expression in chicken using transcriptomics, proteomics and proteogenomic mapping; identification and functional analysis noncoding RNAs; and developing new resources to assist in the application of genomics technologies to non-model animals. She is also affiliated with BIO5 and working to develop tools for functional annotation and analysis that can be deployed to the iPlant/iAnimal platform. Dr. McCarthy is interested in developing better resources for analysis of host-pathogen interactions in disease.

Elain Norton (elainenorton@arizona.edu) *Assistant Professor – DVM, Colorado State, Ph.D. University of Minnesota.*
Dr. Elaine Norton focuses her extensive research on the heritability of equine metabolic syndrome in various breeds of horses and how that relates to the risk of endocrinopathic laminitis - which makes up 80-90% of laminitis cases. This discussion focuses on her study with Welsh ponies and Morgan horses but also breaches into her new research involving Arabian Horses and more.

Benjamin Renquist (bjrenquist@arizona.edu or 520-626-5793) *Associate Professor- Ph.D., UC Davis.*
Dr. Renquist's research addresses four obesity/metabolism centric foci:

Understanding the causative role of hepatic lipid accumulation in the development of obesity associated pathophysiologies. Hepatic lipid accumulation is directly linked to the severity and incidence of both Type II diabetes mellitus and hypertension. Our research aims to understand the signaling mechanism that links hepatic lipid accumulation to these disease states.

The physiological control of feed intake during heat stress. Heat stress suppresses food intake. The Renquist lab is focused on the role of heat induced changes in blood flow and how these may manipulate phagic drive. Since heat stress suppresses milk production, we are also interested in the role of heat stress induced depression of mammary blood flow in the decrease in milk production.

Development of a cell ablation strategy. This research is applied to improving chemotherapeutics for cancer and synthesis of a single dose injectable sterilant.

Predicting growth in aquaculturally important species by measuring the metabolic rate of embryonic aquatic organisms (tilapia, oysters, and shrimp). In fish metabolic rate is tightly coupled to essential functions for growth (e.g., protein and DNA synthesis).

Liliana Salvador (lilianasalvador@arizona.edu or 520-621-1659) *Assistant Professor- Ph.D., University of Lisbon, Lisbon Portugal.*
A central focus of my research is quantitatively modeling ecological and epidemiological processes across spatial and temporal scales. I link individual-level ecological, epidemiological, and evolutionary processes with population-level disease dynamics to better understand the emergence and spread of zoonotic infectious diseases. My core research questions are: '*What ecological, environmental, and biological factors drive the emergence, maintenance, and transmission of zoonotic pathogens?'* and '*How do host, pathogen, and environmental factors interact to shape pathogen specificity, reservoir formation, and disease dynamics?'* To

address these questions, I use an integrative approach that combines comparative genomics, phylodynamics, and transcriptomics with mathematical, statistical, and computational models within a One Health framework.

Duane Wulf *(*dmwulf@arizona.edu or 520-626-3674*) Associate Professor - Ph.D., Colorado State University*.
Dr. Wulf has held faculty positions at The Ohio State University (3 years) and South Dakota State University (11 years). For ten years, Dr. Wulf served as a missionary businessman in Sonora, Mexico where he led start-ups of a meat processing plant, a cattle ranch, and a restaurant, all with the purpose of providing training and career opportunities to the fatherless and less fortunate. In addition to these positions, Dr. Wulf has worked across all production and processing phases of the meat industry and has been hired as a consultant both domestically and internationally by both small and large companies.

Dr. Wulf's research primarily focuses on antemortem (genetics, nutrition, stress) and postmortem (pH, aging, carcass fabrication, processing) factors that affect meat quality. Improving meat quality without the need for excessive fat production would result in less environmental impact and would improve human health. Specifically, his current research is focused on using beef sires on dairy cows, improving the quality of ground beef, and direct marketing of meat from livestock producers to local consumers. Dr. Wulf's focus is beef, but he has also worked with pork, lamb, goat, poultry, goose, ostrich, and crocodile.

Chi Zhou (chizhou@arizona.edu or 520-621-2457) *Assistant Professor - Ph.D., University of Alberta, Edmonton Canada.*
Dr. Zhou is interested in understanding the molecular mechanisms underlying the fetal sex- specific dysregulation of fetal endothelial function in complicated pregnancies, and the maternal obesity-associated fetal endothelial dysfunction as well as future health risks of the offspring. Specifically, work in her laboratory focused on 1) studying the sexual dimorphisms of complicated pregnancies-associated fetal endothelial dysfunction, 2) exploring the role of microRNAs in complicated pregnancies-induced fetal endothelial dysfunction, and 3) examining the effect of maternal obesity on fetal endothelial function and future cardiovascular risks of the offspring. Results from these studies would contribute to the identification of novel biomarkers or therapeutic targets for adult-onset cardiovascular disease in children born to complicated pregnancies.

Adjunct Faculty & Research Interests

Klerachos K. Papas (kkpapas@surgery.arizona.edu or 520-626-4494) *Professor, Surgery - Ph.D. Georgia.*
Dr. Papas has spent the past 21 years of his research career studying the properties of insulin-secreting tissue and their relationship to viability and function. He has worked on the development and validation of assays (especially ones based on mitochondrial function such as oxygen consumption rate) for the real-time, objective assessment of islet quality prior to transplantation. In particular, the assay based on oxygen consumption rate has been recently validated based on its ability to predict diabetes reversal in mice and clinical human islet auto transplants in patients with chronic pancreatitis. He has used these assays along with engineering principles to optimize the islet transplantation process from pancreas procurement to islet infusion to the recipient.

His group has also developed tools for the real time non-invasive assessment of the pancreas and other organs during preservation and is actively involved in research for improving organ preservation technology aimed at extending the allowable time window from procurement to transplantation and the utilization of organs from expanded criteria donors without compromising clinical outcomes. He has had continuous NIH funding for the past 7 years in pancreas preservation and he has spearheaded the effort for the development of humidified oxygen gas perfusion (persufflation) of the pancreas using novel technology for portable in situ oxygen

generation from water via electrochemistry. He is also actively collaborating with leaders in the liquid perfusion field on NIH sponsored projects aiming at improving oxygenation. **His research in this area has the potential to have a profound impact on reducing overall costs, increasing availability, and improving short-and long-term outcomes in solid organ transplantation.**

Jennifer Stern (jhstern@arizona.edu or 520-626-5842) *Assistant Professor-Ph.D., UC, Davis.*
Dr. Stern leads an NIH funded research program focused on understanding the role of glucoregulatory hormone signaling in the pathogenesis of obesity, type II diabetes mellitus, and aging. The goal of Stern lab research is to improve the prevention and treatment of diabetes and age-related metabolic disorders.

Program Administration

The School of Animal and Comparative Biomedical Sciences graduate program committee and associated subcommittees will be responsible for the administering of all aspects of the graduate program, with the approval of the Director.

These responsibilities include:

- Recruitment and Admissions
- Graduate Student Funding
- Procedure and Policy
- Curriculum
- Graduate Teaching Assignments
- Graduate Student Progress

Recruitment and Admissions

Solicitation of applicants for to the M.S. and Ph.D. programs in Animal & Comparative Biomedical Sciences (ACBS) will be done by the School of Animal and Comparative Biomedical Sciences (SACBS) by building on the established reputations of the faculty and existing communication networks, including outreach and the ACBS web page. The graduate program will also be promoted by judicious use of advertisement, brochures, and posters.

The final selection of students to be admitted into the program will be made by the Animal & Comparative Biomedical Sciences Graduate Committee and will be determined from the ranked order of applicants based on their prior academic performance, relevant experience, letters of recommendation, standardized test scores, statement of purpose, and other standard measures (but not including mechanism of financial support).

Student Admittance Procedures

Before additional students are admitted to the program, the current student roster is examined, and predictions are made regarding the number of students that will require funding (and at what level) for next year. A potential primary funding source is identified for each continuing student.

Based on projected program funding and the number of current students supported, the number of students to be admitted with funding is established. The graduate committee will identify both continuing and new students that are eligible for departmental support. The list will be submitted to the Director for approval. Modifications to the list should be approved by the graduate committee.

Graduate Student Funding Policy

The funding policy is designed to enable The School of Animal and Comparative Biomedical Sciences to accept and retain enough students to maintain the viability of the Animal & Comparative Biomedical Sciences Program. Because of the intense nature of graduate study, students receiving funding from the department are strongly discouraged from seeking additional employment.

The funds, utilized by the School of Animal and Comparative Biomedical Sciences, to support graduate stipends are derived from Research Assistantships, Recruiting Fellowships, Teaching Assistantships, Scholarships (e.g., Cowden Fellowships) and faculty contributions. In general, the total of these funds dictates the number of students supported and are viewed as the core budget of the program. Because of the diversity of these funding sources and requirements for accountability, a general fund cannot be established. Funds which have stipulations regarding the type of research training to be supported will be dispensed to students in qualifying disciplines at the discretion of the graduate committee.

Program financial support for graduate students shall be no more than two years (four semesters) for M.S. candidates and four years (eight semesters) for Ph.D. candidates entering the program with M.S. from another institution. Program financial support for students obtaining both an M.S. and a Ph.D. from the University of Arizona – Animal & Comparative Biomedical Sciences Program in succession shall be granted no more than six years total. Support for longer periods of time may be provided by major advisor/professor from grant monies but not from the program's funds. Program support will be provided for all qualified graduate students during their first year of study, except in some cases where a mentor wishes to fully fund the student in the first year, deferring to the one year of full program support.

Funding for students beginning their second year of study will become partially the responsibility of the Major Advisor. The portion of funding to be provided by the major professor in the second and subsequent years shall not exceed 50% of the total stipend to be received by the student. Major Advisors should develop the budgets except for contributing 50 % of the total stipend. The amount shall be established by the graduate committee in the spring semester when the number of incoming students has been established.

If the student's Major Advisor suffers a loss of funding, an alternative source of funding from within the Animal & Comparative Biomedical Sciences Program should be sought. If alternative funding cannot be secured, the graduate committee will attempt, but not guarantee, to provide support on an interim basis for that student.

The current funding procedures and policies of the Program are outlined below:

Stipend Levels

A stipend level request is submitted to the Dean of the Graduate College in the fall semester. Once stipend levels are established, regular funding sources are examined, and applications are submitted to the Graduate College for recruiting and other fellowships.

Pre-Doctoral Fellowships

The Program also has a system to reward those students who personally enter competitions for support (e.g., individual fellowships from outside agencies). If a student is awarded funding from outside agencies, the program and/or Major Advisor will continue to provide tuition or scholarship support.

Graduate Stipend Requirements:

The graduate stipend provided by the School of Animal and Comparative Biomedical Sciences, the State of Arizona, or the Cowden Fellowship is intended as a 12-month stipend. The responsibility of the student in accepting this stipend is to carry out their studies and research over the full 12-month calendar year. If the student accepts the full Program/State stipend he/she cannot supplement that stipend in a fashion that detracts from the full commitment to the School/Program. If the student receives only partial support from the Program/State that the stipend can be supplemented (by the Major Advisor) to the level of full support. However, supplementation including any payment of any kind (lump sum, hourly wages, etc.) from their Major Advisor or other University faculty members, cannot exceed the stipend level set by the program each year, unless the student has personally entered the competitions outlined above.

Students on program stipends are expected to devote a minimum of 20 hours per week to research/teaching/extension activities assigned by the student's Major Advisor or the School. This does not include the time in class and may not include time devoted to working on thesis or dissertation research. **Note: Students are expected to work during the time between academic sessions.** The times between sessions are **not** holidays or vacation days. All requests for leave must be approved by the student's Major Advisor at least two weeks prior to the absence. Normally, leave is accumulated at the rate of one day per month of employment. The policy does not apply to students who do not receive Department/State funds.

Funding for Students Enrolling in Interdisciplinary Programs (IDP):

The School of Animal and Comparative Biomedical Sciences will consider funding graduate student stipends for a student enrolled in IDP's under guidelines presented above for Animal & Comparative Biomedical Sciences Graduate Students.

The IDP students must meet the following criteria:

1. The student has exceptional qualities.
2. The student carries out his/her research in the laboratory of a faculty member of the School of Animal and Comparative Biomedical Sciences.
3. The research topic can be considered as an important contribution to "ACBS" by the graduate committee.
4. Ultimately, the credit for the research contributions (publications, presentations at national meetings), will go to The School of Animal and Biomedical Comparative Sciences

Curriculum

Graduate curriculum and requirements are established by the ACBS faculty members and must be consistent with the Graduate College requirements.

Laboratory Rotations

A student may request a series of laboratory rotations (maximum of three laboratories). Laboratory rotations will be approved by their graduate committee and are not to exceed two semesters. Once students complete a rotation in a single laboratory, they must submit a laboratory rotation report form to the Program Committee Chair (see appendix V). The purpose of the form is to ensure a quality laboratory experience for the student.

Incomplete Policy

Students earning a grade of incomplete (I) grade for a course should submit a Report of Incomplete Grade form to the ACBS Grad Program Coordinator for inclusion in their academic record. This form can be found at https://registrar.arizona.edu/records-enrollment/enrollment/grades-faqs/incomplete-grade-information.

Incomplete grades should be completed in a timely manner and are submitted at the discretion of the course instructor.

Graduate Student Progress

Annual reports will be provided by all graduate students to the graduate committee (Form I in Appendix I). These reports, along with academic performance, will be the basis for establishing which students receive initial and continued financial support for the Animal & Comparative Biomedical Sciences Program. Upon review by the Graduate Committee and upon concurrence with the Director of Graduate Studies, students not making satisfactory progress will not receive continued funding from the program.

Student Role in Departmental Governance

The Graduate Program is administered by an Executive Committee. The Executive Committee is chaired by the Director of Graduate Studies, and includes at least 2 other ACBS faculty members, an Animal & Comparative Biomedical Sciences graduate student representative, and the Graduate Coordinator. The graduate student representative is elected by the graduate student body of the ACBS Graduate Program for a one-year term. The student representative serves as an official liaison between the students and faculty of the graduate program. The representative is responsible for organizing graduate student participation in Program endeavors, as well as serving on Program committees in an advisory capacity. The student body should seriously consider their choice of the graduate student representative to maintain an effective student voice in Program issues.

Student Appeal Policies

A student may appeal any of the requirements previously mentioned. The appeal should be made in writing to the Director of Graduate Studies of the Animal & Comparative Biomedical Sciences Graduate Program. The appeal will be reviewed by the Executive Committee and may include a collective meeting with the student and the Major Advisor. A decision to accept the appeal of the specific requirement will be based on a majority vote by the Executive Committee. Terms and additional requirements may be placed on the student as a prerequisite for continuing in the program. Students may appeal the Executive Committee decision with a written request to the Director of The School of Animal and Comparative Biomedical Sciences. The written appeal must include the original appeal to the Executive Committee, the conclusion of the Executive Committee, and the rationale or response to the Executive Committee decision.

Professional Conduct

Professional conduct involves both a commitment to follow the letter of the assistantship contract and the requirements outlined in the Handbook. Appointment of a teaching assistantship (TA) or research assistantship (RA) is a privilege, not a right. Irresponsible actions exhibited while enrolled in the Animal & Comparative Biomedical Sciences Graduate Program and at the University, risk damaging the student's own reputation and the reputation of the Program. TA and RA positions are exciting opportunities for graduate students to develop professional skills that will carry through the rest of their careers. Enjoy the benefit from these assistantships and do not abuse the privilege.

Student Responsibility

Graduate Students are expected to follow the policies and procedures for both the UA Graduate College and for the Animal & Comparative Biomedical Sciences Graduate Program. Policies are updated frequently, and it is the student's responsibility to comply with current policies. Graduate College Policies can be viewed online at

https://grad.arizona.edu/new-and-current-students and University policies can be found at http://catalog.arizona.edu/.

Programs of Study

The School of Animal and Comparative Biomedical Sciences offers graduate studies leading to both M.S. and Ph.D. degrees with a major in Animal & Comparative Biomedical Sciences. The school is housed in the College of Agriculture, Life and Environmental Sciences. Numerous opportunities exist for course work and research in areas ranging from current animal production techniques to recombinant DNA research on fundamental animal and cell physiology problems.

Areas of Study include:

- Bioinformatics
- Dairy/Beef Cow Management
- Physiology
    - Reproductive Physiology
    - Nutritional Physiology
    - Environmental Physiology
    - Metabolic Physiology
    - Neurophysiology

The M.S. degree is the traditional research-based degree culminating in a thesis. There is also a non-thesis MS option, only available to management or RTIP students that emphasizes professional opportunities in animal agricultural-related business. The information for the non-thesis M.S. can be found in Appendix III. For the Doctor of Philosophy degree, students develop a novel research project that is supported by coursework in biochemistry, physiology, and statistics.

Master of Science (Thesis Option)

Course Requirements

A minimum of 30 units of graduate credits are required. All coursework units in the major field must be at the 500 level or above to be applied to the Program of Study.

- 24 units must be non-thesis (not ACBS 910) units.
- At least 1 unit of thesis (ACBS 910)
- At least 15 units must be graded courses in which regular grades (A, B, C, D, E) have been earned. 5/15 units must be from courses offered by The School of Animal and Comparative Biomedical Sciences.
    - At least 3 units of statistics coursework
    - At least 3 units of physiology coursework
    - 2 units of seminar (ACBS 696). Students should present a seminar at least once a year. ***During your MS, you are required to attend all seminars even if you are not registered for ACBS 696A.***

Additional requirements for completion of the degree will be determined by the Major Advisor and The Graduate (Thesis) Committee.

Students transferring to the University of Arizona with graduate credits from other institutions can petition to apply for up to 12 graduate credits to the major in this program. However, only graded courses are acceptable, and the transfer credits must be approved by the Graduate Committee. If a student is transferring courses, they will need to fill out the ***Evaluation of Transfer Credit Form*** via GradPath.

Major Advisor and Graduate (Thesis) Committee

Upon acceptance each student chooses a Major Advisor in the student's interest. The Major Advisor must be an ACBS Graduate Faculty Member (Assistant Professor, Associate Professor, or Professor) and will assist the student with the selection of their Graduate (Thesis) Committee. The student's Graduate (Thesis) Committee will consist of their Major Advisor and at least two other faculty members. The two additional committee members must meet the following qualifications:

- At least one member must be on the ACBS Faculty
- At least one needs to be a tenure-track faculty

The Graduate (Thesis) Committee will also be responsible for the approval of the thesis and for the final examination. Once the Graduate (thesis) committee is selected, the student should submit the ***Master's/Specialist Committee Appointment Form*** via GradPath.

Plan of Study

In conjunction with their Major Advisor, each student is responsible for developing a Plan of Study during the first few months in residence, which must **be submitted to the Graduate College no later than the second semester in residence.** All deficiencies must be satisfied before the Plan of Study is approved.

The Plan of Study identifies (1) courses the student intends to transfer from other institutions; (2) courses already completed at the University of Arizona which the student intends to apply toward the graduate degree; and (3) additional course work to be completed to fulfill degree requirements.

Once the Plan of Study has been agreed upon by the student and their thesis committee, the student should submit the ***Plan of Study Form*** via GradPath. After submission, The Plan of Study must have the approval of the following people in this order: the ACBS Graduate Coordinator, the Major Advisor, the Director of Graduate Studies, and lastly the Graduate College (Degree Counselor). All approvals are completed in GradPath. Once the Graduate Coordinator has approved the Plan of Study, he/she will notify the student, and it is their responsibility to notify their Major Advisor to do the same.

There is a onetime Fee associated with the submission of your Plan of Study.

Academic Performance

The Graduate College Policies and Procedures states that "No student will be recommended for award of an advanced degree unless he/she has achieved a grade average of 3.0 or better on: (a) all coursework taken for graduate credit and (b) all coursework included specifically in their graduate program."

Any student who fails to achieve a GPA of 3.0 for two consecutive semesters is at risk of being disqualified from the program. The graduate committee of such a student should meet at the earliest possible time to determine whether a student should continue in their degree program or be withdrawn from the program.

Teaching Component

Teaching experience is an important part of graduate training in the Animal & Comparative Biomedical Sciences Graduate Program. All graduate students shall participate in the teaching activities of the department in one course per year, and all students must go through the University's TATO and FERPA Training.

FERPA Training

All students are protected by a federal privacy law called FERPA (The Federal Education Right Protection Act). Since TAs are dealing with sensitive student records in an official capacity, they are bound by this law. The University of Arizona requires that all employees with access to student records complete an online training course. Failure to complete this course within two weeks of starting your position as a TA, will render you ineligible to serve as a TA and your position may be terminated. The course can be accessed at: http://registrar.arizona.edu/personal-information/ferpa-tutorial

TATO (TA Training online)

Teaching Assistant/Associate Training Online (TATO) is a collection of self-paced modules about teaching and learning made available via Brightspace. All students who wish to be appointed as Teaching Assistants/Associates (TAs) must complete the training and pass the test with a score of 95% or higher no later than two weeks after the start of classes.

It is recommended that TAs review the information from all modules in TATO before the beginning of each semester. Individual departments may also assign *additional* modules from TATO.

Please note that the mandatory training ***Graduate Assistant/Associate Teaching Orientation (GATO) is no longer offered or required by the Graduate College*.** However, individual departments or colleges may be requiring in-person training. Please contact the appointing department for more information.

Instructions to Access TATO training

1. Go to **brightspace.arizona.edu** .
2. Click on the button labeled "UA NetID Login" in the upper left side of the screen.
3. Enter NetID and password.
4. Click the **Discover** link located at the top left side of the screen. The Discover page contains all the courses that are available for self-enrollment. There are two ways to find a course if you don't see it listed in the course tiles: Select the **Browse All Content** option at the top of the Discover widget or you can use the search box to search for the course by any word in the title of the course.
5. Select TATO. This will take you to the course enrollment page.
6. Click the **Enroll in Course** button to self-enroll for the course. NOTE: If you are already enrolled in the course, the button will read **Open Course.** This offers a secondary way to get back to a course.
7. When the enrollment is complete, you can click the **Open Course** button to go directly to the course.
8. To quickly find a Discover course you are already enrolled in, select the Discover Courses tab in the My Courses widget on your D2L home page.

Any questions or concerns should be directed to **treanorj@arizona.edu**.

Deadline

The deadlines for completion of the required TATO and FERPA are below.

Fall 2025 – September 2025 (See Graduate College website for specific date)
Spring 2026 – January 2026 (See Graduate College website for specific date)

The deadlines for completion of the required trainings are below. Completion of these required modules monitored by Graduate College staff to ensure completion of this important training. Please contact **U of A Brightspace Help** if you experience any issues within the TATO modules themselves. ***TAs who fail to complete either of these trainings will be ineligible for further employment and will be terminated***.

Thesis Requirements

Master's theses present significant research by students and are a vital part of the University of Arizona's academic contributions. A master's student who completes a thesis is required to submit the final approved thesis for archiving. Archiving does not preclude publication by other methods. Successful master's candidates are also encouraged to submit thesis material for publication in scholarly or professional journals. Suitable acknowledgment must indicate the publication to be a thesis, or portion of a thesis, submitted in partial fulfillment of the requirements for a master's degree at the University of Arizona.

The instructions below apply to students who completed Thesis (course number 910) as a requirement for a master's degree.

The master's degree for a student completing a thesis will not be awarded until the Graduate College receives and accepts the thesis submission with the supporting forms (see the submission steps below).

Thesis Submission Deadline

All requirements for the master's degree, including the submission of the final, approved thesis for archiving, **must** be completed by the published deadline for graduation in that semester or term. The submitted thesis must be the **final** thesis approved by the thesis committee with no edits or revisions remaining. See Grad College Website for full instructions on how to submit your thesis.

Student must reach out to the Graduate Coordinator to start the Adobe Sign workflow for the Thesis Approval page.

Thesis Archiving

A student completing a master's thesis (with enrollment in course number 910) is required to archive the thesis upon final approval of the thesis committee. The thesis will be added to the University of Arizona Campus Repository and to the national archive of dissertations and theses maintained by ProQuest/UMI. There is no charge to the student for archiving the thesis. The thesis must have been successfully defended and approved by the thesis committee with all final edits completed in time for the student to submit it online for archiving by the graduation deadline for the student's graduation term.

Upon submitting the thesis for archiving, the student may elect to file a copyright for it. Students who may wish to file a copyright can refer to this copyright explanation. There is a fee for copyrighting should a student choose that option.

Archiving the thesis does not preclude publication by other methods. Successful master's candidates are encouraged to submit thesis material for publication in scholarly or professional journals. Suitable acknowledgment must indicate the publication to be a thesis, or portion of a thesis, submitted in partial fulfillment of the requirements for a master's degree at the University of Arizona.

Research involving human subjects or vertebrate animals requires permission from the relevant University committee to be in compliance. Consult your Major Advisor and the Office for the Responsible Conduct of Research (link is external) for details. For specific questions please contact them at (520) 626-5515.

Final Examination

A candidate for the Master's degree (thesis option) must present a seminar on their thesis and must pass a final oral examination administered by the student's Thesis Committee. The examination will cover the thesis and general topics in the field of study. The result of the examination must be reported to the Graduate College within two weeks. Prior to reporting the completion of a degree, the major advisor must first notify the Graduate Coordinator. The Graduate Coordinator will then submit a ***Master's/Specialist Completion Confirmation Form*** on behalf of the student, which will then be forwarded to the Program's assigned Degree Counselor (Graduate College) for finalization.

Any candidate who fails the final examination, upon the recommendation of the major department and approval of the Graduate Council, may be granted a second examination after at least one whole semester. The report of successful completion of all requirements (Report on the Final Examination and the Completion of Requirements for the Master's Degree) must be made to the Graduate College at least four weeks before the date on which degrees are awarded and the student must be registered during the semester in which they graduate.

Completion of Requirements

When the student's department determines that the student has completed all degree requirements, the department's Graduate Coordinator will submit the Master's/Specialist Completion Confirmation form in GradPath on behalf of the student. The submission of the Completion Confirmation form initiates the Graduate College's final audit of the student's program and ultimately leads to the award of the student's degree following resolution of any outstanding issues.

All grades for Incompletes and current semester coursework must be received before the degree is considered completed. A student must have a cumulative GPA in all graduate coursework of at least 3.00 to graduate.

For dates by which requirements must be met to graduate in a particular semester, please refer to the Important Deadlines.

While minor changes to the name on the diploma may be requested from Graduate Student Academic Services, changes to the official name on the student record or significant changes to the diploma name must be filed with the Registrar's Office (link is external). Any outstanding financial debts to the University may prevent students from ordering official transcripts or receiving their diploma. Please contact the Bursar's office at 621-3232 for assistance with these matters.

Graduating students are requested to complete the Grad College exit survey that provides an overview of your experience to future students. They need and appreciate your feedback.

M.S. Degree Program Timeline

YEAR 1

1. Develop a proposed PLAN OF STUDY in consultation with your Major Advisor by the end of your first semester. This will establish a set of courses that are required for your program.
2. Submit the ***PLAN OF STUDY Form*** (via Gradpath) during your second semester.
3. Any courses that you plan on transferring should be transferred by the end of Year 1. (Using *Evaluation of Transfer Credit Form* via GradPath).
4. Elect your Graduate Committee (Advisory or Thesis), with the help of your Major Advisor. After you have selected your graduate committee members complete the *Master's/Specialist Committee Appointment Form* in GradPath. This should be completed by the end of your first year.
5. Make sure you have at least **one meeting** with your Graduate Committee during **Year 1**.
6. Submit the Annual Progress Report in March (All student who are receiving funding must complete this by March 1st).

YEAR 2

1. Submit your Annual Progress Report in March (All students who are receiving funding must complete this by March 1st).
2. Make sure you have your 2nd committee meeting by the end of your 3rd semester.
3. Your thesis should be completed by end of your second year. Once you have passed your final examination and completed your thesis with necessary revisions, your Major Advisor should notify the ACBS Graduate Coordinator so he/she can fill out the Master's/Specialist Completion Confirmation Form.
4. The Graduate College requires that MS students archive their thesis. To ensure that your degree is completed, please see the deadlines on the Graduate College website for archiving.

Doctor of Philosophy

Course Requirements

A minimum of 63 units of graduate credits are required. All required units must be at the 500 level or above at the University of Arizona.

- At least 36 units of coursework in the major subject
- At least 9 units in the minor subject
- At least 18 units of dissertation (ACBS 920)
- At least 22 units must be graded courses in which regular grades (A, B, C, D, E) have been earned.
- *Graded coursework must include:*
    - 3 units of statistical design
    - 3 units of biochemistry
    - 2 units of seminar (ACBS 696). You should present at seminar at least 1 time per year. ***During your Ph.D., you are required to attend all seminars even if you are not registered for ACBS 696.***

You must meet the minimum requirements mentioned above, established for the Ph.D. degree in ACBS.

A maximum of 10 units of individual studies (ACBS 599, 699 or 900) will be allowed for use toward the Ph.D. degree.

Additional requirements for completion of degrees will be determined by the student's Major (Dissertation) Advisor and their Graduate (Dissertation) Committee. Graduate credit earned at other approved institutions, if accepted by the student's major department and the Graduate College (see ***Transfer Credit Evaluation Request Form*** on GradPath) may be counted toward this degree.

Major (Dissertation) Advisor/Graduate (Dissertation) Committee

The Major (Dissertation) Advisor serves as the mentor for a Doctoral Candidate. An incoming student may be designated a temporary Major Advisor. However, during the first year, the student needs to select a permanent Major Advisor that is approved by the ACBS Graduate Committee. A student is allowed to change their Major Advisor with the ACBS Graduate Committee approval. However, a student must have a Major Advisor to maintain satisfactory academic progress.

The Graduate (Dissertation) Committee consists of at least 5 members: the Major Advisor, two ACBSs Graduate Program faculty members and 2 members from the department/graduate program of the minor area of study. Four out of the five committee members, including the Major Advisor must be an ACBS Graduate Faculty and/or listed as graduate faculty of another UA Department. In appropriate instances, a faculty member from an outside department other than that of the minor area of study may be substituted for one minor area of study departmental participant. Such an appointment requires approval of the Dean of the Graduate College via petition. Remember all committee members are expected to attend your final examination in its entirety. Once the Graduate (Dissertation) Committee members are selected, the Comprehensive Examination Committee Appointment Form must be submitted via GradPath before the student takes their Comprehensive Examination.

Plan of Study

In conjunction with the Major Advisor, the student is responsible for developing a Plan of Study in the first year in residence, to be filed with the Graduate College **no later than the third semester in residence**. The Plan of Study identifies: 1) courses the student intends to transfer from other institutions 2) courses already completed at the University of Arizona, which the student intends to apply toward the graduate degree and
3) additional course work to be completed to fulfill degree requirements.

The Graduate (Dissertation) Committee helps the student plan the Doctoral Degree – Plan of Study. They help to determine what courses a student needs to take and are responsible for evaluating a student's progress during all phases of training.

Once the Plan of Study has been agreed upon by the student and their Graduate (Dissertation) Committee, the student should submit the ***Plan of Study Form*** via GradPath. After submission, The Plan of Study must have the approval of the following people in this order: The ACBS Graduate Coordinator, Major Advisor, ACBS Director of Graduate Studies, and lastly the Graduate College (Degree Counselor). All approvals are completed in GradPath. Once the Graduate Coordinator has approved the Plan of Study, he/she will notify the student, and it is their responsibility to notify their Major Advisor to do the same.

Academic Performance

The Graduate College Policies and Procedures states that "No student will be recommended for award of an advanced degree unless he/she has achieved a grade average of 3.0 or better on: (a) all coursework taken for graduate credit and (b) all coursework included specifically in their graduate program."

Any student who fails to achieve a GPA of 3.0 for two consecutive semesters is at risk of being disqualified from the program. The graduate committee of such a student should meet at the earliest possible time to determine whether a student should continue in their degree program or be withdrawn from the program.

Teaching Component

Teaching experience is an important part of graduate training in the Animal & Comparative Biomedical Sciences Graduate Program. All graduate students shall participate in the teaching activities of the department in one course per year, and all students must go through the University's TATO and FERPA Training.

FERPA Training

All students are protected by a federal privacy law called FERPA (The Federal Education Right Protection Act). Since TAs are dealing with sensitive student records in an official capacity, they are bound by this law. The University of Arizona requires that all employees with access to student records complete an online training course. Failure to complete this course within two weeks of starting your position as a TA, will render you ineligible to serve as a TA and your position may be terminated. The course can be accessed at: http://registrar.arizona.edu/personal-information/ferpa-tutorial

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It is recommended that TAs review the information from all modules in TATO before the beginning of each semester. Individual departments may also assign *additional* modules from TATO.

Please note that the mandatory training ***Graduate Assistant/Associate Teaching Orientation (GATO) is no longer offered or required by the Graduate College*.** However, individual departments or colleges may be requiring in-person training. Please contact the appointing department for more information.

Instructions to Access TATO training

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3. Enter NetID and password.
4. Click the **Discover** link located at the top left side of the screen. The Discover page contains all the courses that are available for self-enrollment. There are two ways to find a course if you don't see it listed in the course tiles: Select the **Browse All Content** option at the top of the Discover widget or you can use the search box to search for the course by any word in the title of the course.
5. Select TATO. This will take you to the course enrollment page.
6. Click the **Enroll in Course** button to self-enroll for the course. NOTE: If you are already enrolled in the course, the button will read **Open Course.** This offers a secondary way to get back to a course.
7. When the enrollment is complete, you can click the **Open Course** button to go directly to the course.
8. To quickly find a Discover course you are already enrolled in, select the Discover Courses tab in the My Courses widget on your D2L home page.

Any questions or concerns should be directed to **treanorj@arizona.edu**.

Deadline

The deadlines for completion of the required TATO and FERPA are below.

Fall 2025 – September 2025 (See Graduate College website for specific date)
Spring 2026 – January 2026 (See Graduate College website for specific date)

The deadlines for completion of the required trainings are below. Completion of these required modules monitored by Graduate College staff to ensure completion of this important training. Please contact **U of A Brightspace Help** if you experience any issues within the TATO modules themselves. ***TAs who fail to complete either of these trainings will be ineligible for further employment and will be terminated***.

Comprehensive Examination for Advancement to Candidacy

Before admission to candidacy for the doctoral degree, the student must pass a Doctoral Comprehensive Examination, composed of a separately tested written and oral portion, in the chosen field of study. The comprehensive exam will be held when essentially all course work has been completed, usually at the end of the second year of study. At minimum, the exam must be completed 6 months before the final oral examination. This examination will test the student's general knowledge of ACBS based subjects and greater in-depth fields of specialization within the major and minor subjects of study. Both the written and the oral exam will cover major and minor fields of study, depth fields of specialization within the major and minor subjects of study.

The oral portion must be taken within 2 months of completing and **passing** the written portion. It is recommended that the student arranges a committee meeting approximately six weeks prior to the proposed examination date. At this meeting the student's general research interests, background and projected timetable for the exam can be discussed. The committee can use this as an opportunity to inform the student of its general expectations and make suggestions on how to prepare (i.e., suggested readings). Students must remember that there is a difference between the Oral Comprehensive Examination which should be passed prior to advancing to the Final Oral Examination. Additionally, when students have decided on the date when they will complete their Comprehensive exam, they must file an ***Announcement of Doctoral Comprehensive Examination Form*** via GradPath.

Written Comprehensive Exami**n**ation

This portion of the Comprehensive Exam will consist of 1-3 questions from each Graduate (Dissertation) Committee Member. Each committee member will be allotted a three-hour block of time, and all questions must be completed within a one-week period. Committee members will then grade the answer to the question(s) they presented and determine if the student passed or failed the questions. The student must successfully answer questions from four of the five committee members to advance to the Oral Comprehensive Examination. If the student doesn't pass on their first attempt, they are allowed to re-take the written portion a maximum of 2 times with the approval of the ACBS Graduate Committee.

Oral Comprehensive Examination

Upon successful completion of the written portion of the Comprehensive Exam, the Oral Comprehensive Exam is conducted in front of the dissertation committee. As stated previously, the oral portion of the comprehensive exam must be completed within 2 months of completing the written portion. Oral Comprehensive exams are scheduled through the department. This is where the faculty committee members have both an opportunity and obligation to have the student show their broad knowledge in the chosen field of study and sufficient depth of understanding in areas of specialization. Although, a discussion of the proposed dissertation research may be important, it can't be the only topic that is discussed. To fulfill the requirements of the oral portion, the student must be able to display to the committee that they have depth of knowledge in their area of study, not just in their research.

For a student to pass the oral portion, the student's Graduate (Dissertation) Committee "must be able to attest that the student has demonstrated a professional level of knowledge expected of a junior academic colleague." If the student has passed both the oral and written portions, The Graduate (Dissertation) Committee Chair (the Major Advisor) needs to submit the Results of Oral Comprehensive Exam via GradPath. If the student fails their first attempt, the graduate college allows for **only** one more attempt. The Graduate College requires a four-month waiting period between attempts.

When the student has an approved doctoral Plan of Study on file with the Graduate Student Academic Services Office, has satisfied all course work, language, and residence requirements, and passed the written and oral portions of the Comprehensive Examination, their bursar account will be billed the candidacy fee. This is a one-time fee, and the student will not be billed again if they change their anticipated graduation date.

At this time, the student shall also submit a ***Doctoral Dissertation Committee Appointment Form*** via GradPath. The Doctoral Dissertation Committee Appointment form reports the student's planned dissertation committee, dissertation title (subject to change) and the expected graduation term. It requires approval from the dissertation director and the major and minor departments. The approval signature from the minor department on this form indicates both approval of the reported dissertation committee and confirmation that the student

has satisfied all requirements for the minor. This should be complete roughly 6 months prior to the scheduled Final Oral Exam (Dissertation Defense).

The Dissertation Proposal/Prospectus

In the semester following the comprehensive exams, students should complete and present to The Graduate (Dissertation) Committee a proposal that provides a compelling rationale and research plan for the dissertation topic. The dissertation proposal/prospectus is not part of the Comprehensive Examination, but it is a key requirement of the ACBS Program. It will provide a valuable opportunity for students to develop grant-writing skills and to receive feedback on their proposed project from their committees at a relatively early stage of the experiments. The goal of this is to develop a rigorous and feasible experimental plan that will serve as a guide for the dissertation research, although the experiments may be modified, if necessary, as the work progresses.

The proposal should be written in the USDA or NIH format but with the following page limitations (please note: pages should be single spaced):

- Specific Aims (1)
- Background and Literature Review (3)
- Experimental Design (6)
- Literature Cited (as necessary)

Many students will have already initiated the dissertation project. Preliminary data are not required but may be included in the background section of the proposal.

The completed draft of the proposal should be provided to the Graduate (Dissertation) Committee for comment, and a meeting between the student and the committee should take place at which time the student will field questions about the rationale, design, and interpretation of the proposed experiments. Once the dissertation proposal has been revised to the satisfaction of all members of the Graduate (Dissertation) Committee, the chair of the committee is to notify the ACBS Graduate Coordinator, who will submit the ***Dissertation Proposal Form*** (via GradPath) on behalf of the student. A copy of this proposal should also be submitted to the ACBS Graduate Coordinator to keep on file, to be included in the student's annual performance review.

Ph.D. Dissertation

Early in the dissertation process, each student should meet with his/her Graduate (dissertation) committee to discuss the scope and progress of the dissertation research. The candidate should meet with the committee each year to review this information and formulate any new plans that seem appropriate. All Ph.D. programs require the completion of a dissertation, which meets the required standards of scholarship and demonstrates the candidate's ability to conduct original research that results in peer review publication**.**

The student needs to get the proper approval for research. Listed are the locations that need to be contacted depending on what type of research you are conducting:

- Office for the Responsible Conduct of Research (Human Subjects and/or Vertebrae Animals)
- Institutional Animal Care and Use Committee (IACUC) (Vertebrae Animals. Students that are conducting research of animals must have an **approved** IACUC protocol before starting their research with animals.
- Human Subjects Committee (Humans)

Instructions relating to the format of the dissertation and required abstracts are included in the Dissertation Formatting Guide (including those that include previously published papers, papers accepted for publication, and/or papers with multiple authors). For more information, see the Graduate College website.

Student must reach out to the Graduate Coordinator to start the Adobe Sign workflow for the Doctoral Approval page.
Upon completion of the dissertation research, the student should submit a completed copy of the draft to each member of the graduate (dissertation) committee AT LEAST three weeks prior to the Final Oral Examination (Dissertation Defense).

Final Oral Examination (Dissertation Defense)

After the submission of the dissertation, the student is ready to move on to the Final Oral Examination. The date, time, and location of the final examination must be scheduled with the Graduate College in advance using the ***Announcement of Final Oral Defense Form*** in GradPath. This form should be submitted far enough in advance of the examination that all approvers can grant their approval in time for the form to reach the Graduate College one week prior to the exam.

The Graduate College will place an announcement on the UA master calendar to invite the public to attend the candidate's presentation of his or her work. Final Oral Examinations should be scheduled during days when the University is in session and during normal business hours. Permission to hold examinations during University holiday closures or outside of normal University business hours may be granted by Graduate College.

The Major Advisor presides over the examination. The initial seminar portion during which the student presents the dissertation research and entertains questions is open to the public. The Graduate (Dissertation) Committee's deliberation is closed to the public.

There is no minimum time limit for the Final Oral Examination, but the entire proceedings may not exceed three hours. Members of the committee must **ALL** be present for the **ENTIRE** examination. Should special circumstances require a member to attend remotely, prior permission from the Graduate College is necessary.

If the committee requires revisions, those must be done in a timely manner, not to exceed one year. If the revisions are not completed by the dissertation submission deadline for the term when the student defends, the student will be required to register for the next semester and will graduate in the semester when the revisions are complete and approved. If revisions are not done by the end of the time to degree period, the student will have to re-take comprehensive examinations to demonstrate currency of knowledge.

If the student has completed all coursework and their dissertation, but has not defended, they must enroll in at least 1 unit for the semester that they plan on defending.

Lastly, after the student successfully passes the Final Oral Examination, the committee chair (Major Advisor) must submit the ***Results of Final Defense Form*** in GradPath.

Final Copies of Dissertation Document

Following the successful completion of the Final Oral Examination, the candidate submits the dissertation electronically for forwarding to the Library of the University of Arizona and to ProQuest. Upon receipt of the finalized dissertation, the Dean of the Graduate College will recommend conferral of the doctoral degree by the Arizona Board of Regents. The student should have all necessary edits completed and use the formatting guide for dissertations provided by the Graduate College. For dissertation submission deadlines, please visit the Grad College website (Degree Requirement > Important Degree Dates and Deadlines).

Ph.D. Degree Program Timeline

YEAR 1

1. Develop a proposed **PLAN OF STUDY** in consultation with your Major Advisor. This will lay out a set of courses that are required for the program.
2. You must select your Graduate (Dissertation) Committee in consultation with your Major Advisor.
    a. Once you have selected a committee you need to complete the ***Comprehensive Exam Committee Appointment Form*** via Grad Path. (**This form MUST be completed prior to your comprehensive exam**)
3. If you have elected or the ACBS Graduate Committee has suggested lab rotations, meet with the two or three faculty members you have selected to complete these with and design the goals of the rotations. Submit the complete lab completion form.
4. Submit the annual progress report in March (Student receiving funding **must** submit this form no later than March 1st)

YEAR 2

1. Schedule a meeting with your Graduate (Dissertation) Committee at the beginning of your second year to discuss and set a date for your comprehensive exam.
2. Submit the ***Plan of Study Form*** via GradPath **no later than your 3rd semester in residence**.
3. Submit your annual progress report in March (Student receiving funding **must** submit this form no later than March 1st)
4. Complete most of your course work by the end of your second year.
5. Complete the Comprehensive Exams (Written and Oral). Remember these forms need to be filed via GradPath:
    a. Submit the ***Announcement of Doctoral Comprehensive Form*** prior to taking Comprehensive Exam
    b. The ***Results of Oral Comprehensive Examination for Doctoral Candidacy Form*** needs to be submitted by the committee chair, once a student passes their Comprehensive Exam.
    c. Once both the Plan of Study and the Results of Oral Comprehensive Exam are on file with the Graduate College, you must then submit ***The Doctoral Dissertation Committee Appointment Form*** via GradPath.

YEARS 3 - 4

1. Meet with your committee early in the year to ensure progress to your degree.
2. Submit the annual progress report in March (Student receiving funding **must** submit this form no later than March 1st)
3. Dissertation Proposal should be completed by your **5th semester**.
    a. Once it has received approval from your committee, your Major Advisor MUST notify the ACBS Graduate Coordinator, so he/she can submit the ***Verification of Prospectus/Proposal Approval Form*** to the Graduate College and a copy of the proposal should be provided to keep on file.
4. Your Dissertation should be completed **mid-way through your 8th semester**. Penultimate copies of your Dissertation must be submitted to committee members at least three weeks prior to the scheduled final exam.
5. After your dissertation is completed and submitted, you and your committee need to determine the date that your Final Oral Examination will take place. When specifics are decided and agreed upon, you

need to file the ***Announcement of the Final Oral Exam Form*** with the Graduate College through GradPath. (Remember Grad College needs to approve the Date of Exam at minimum one week before the exam is to take place.)

   a. After you take and successfully pass your Final Oral Examination, your Major Advisor needs to submit the ***Results of Final Defense Form*** in GradPath.

6. Once you have passed your Final Oral Defense and you have made the necessary edits to your dissertation, then the final step is to submit the dissertation electronically for forwarding to the Library of the University of Arizona and to ProQuest.

Minor in Animal & Comparative Biomedical Sciences

The Ph.D. Minor in ACBS requires nine graduate units (six of which must be A, B, or C grades). Specific courses will be determined by the ACBS faculty representatives on the student's graduate committee.

UA Graduate College Links

UA Graduate College: **http://grad.arizona.edu/**
The Graduate Center: **https://gradcenter.arizona.edu/**
Counseling and Psych Services: **https://caps.arizona.edu/**
International Student Services: **https://international.arizona.edu/iss**
Disability Resource Center: **https://drc.arizona.edu/**
Basic Needs: **https://asuatoday.arizona.edu/basic-needs/overview**
General Catalog **http://catalog.arizona.edu/**
Academic Integrity: **http://deanofstudents.arizona.edu/codeofacademicintegrity**
Responsible Conduct of Research: **http://www.orcr.arizona.edu/**

Appendix I

Animal & Comparative Biomedical Sciences Graduate Student Annual Report

Student Name:
Degree Sought:
Major:
Minor:
Thesis/Dissertation Title:
Committee Members
Major Advisor:
Faculty (Major):
Faculty (Major):
Faculty (Minor):
Faculty (Minor):
Additional:
Previous Academic Institutions

Date Submitted:
UA Start Date:
Calendar Year:
Expected Grad Date:

Publications (from previous institutions):

Signatures

Student: _____Date: _____

Major Advisor: _____Date: _____

ACBS Graduate Student Yearly Updates Year 1 (Page 1 of 2)

Coursework: List all courses in which you registered in (including drops and incompletes).

Semester	Course Title	Course Number	Number of Units	Grade Received
Fall				
Spring				
Summer				

Courses Taught: List all courses you assisted with.

Semester	Course Title	Course Number	Sections
Fall			
Spring			
Summer			

Dates of Committee Meetings:

Qualifying Exam Completion Date (Ph.D. Only):

Scientific Meetings Attended:

ACBS Graduate Student Yearly Updates Year 1 (Page 2 of 2)

Publications:

Grants:

Research Progress:

ACBS Graduate Student Yearly Updates Year 2 (Page 1 of 2)

Coursework: List all courses in which you registered in (including drops and incompletes).

Semester	Course Title	Course Number	Number of Units	Grade Received
Fall				
Spring				
Summer				

Courses Taught: List all courses you assisted with.

Semester	Course Title	Course Number	Sections
Fall			
Spring			
Summer			

Dates of Committee Meetings:
Date of Final Exam (M.S.):
Date of Comprehensive Written Exam (Ph.D.):
Date of Comprehensive Oral Exam (Ph.D.):
Dissertation Proposal (Date of Completion- Ph.D.):
Scientific Meetings Attended:

ACBS Graduate Student Yearly Updates Year 2 (Page 2 of 2)

Publications:

Grants:

Research Progress:

ACBS Graduate Student Yearly Updates Year 3/4 (Page 1 of 2)

Coursework: List all courses in which you registered in (including drops and incompletes).

Semester	Course Title	Course Number	Number of Units	Grade Received
Fall				
Spring				
Summer				

Courses Taught: List all courses you assisted with.

Semester	Course Title	Course Number	Sections
Fall			
Spring			
Summer			

Dates of Committee Meetings:
Date of Final Exam:
Scientific Meetings Attended:

ACBS Graduate Student Yearly Updates Year 3/4 (Page 2 of 2)

Publications:

Grants:

Research Progress:

Appendix II

Selecting a Major Advisor

Each student is expected to select a Major Advisor by the end of their second semester in the program. A Major Advisor is a faculty member who will serve as a mentor, supporter, tutor, master, sponsor and role model. A Major Advisor is expected to interact with the student on a regular basis providing guidance, advice, and the intellectual challenge necessary for the student to complete the degree program. The following suggestions may be of assistance to graduate students in choosing a Major Advisor. The first area has a professional basis and the second a personal basis. The choice of a Major Advisor may be the single most important decision during your graduate career.

When considering the professional aspects of your selection of a Major Advisor the following questions may prove helpful:

1. **What is this individual's reputation OUTSIDE the University?** Remember, when you have completed your graduate degree and you are looking for a position, your Major Advisor's reputation will initially be your reputation.
2. **Does your prospective Major Advisor have the funding available to support your research for at least three years?** This area is probably the most problematic for most graduate students. The money needed to fund your research project will most likely come from your Major Advisor's laboratory. Also, although your stipend money is relatively stable, the Major Advisor is expected to contribute an amount equal to one half of your stipend to the ACBS Program. Therefore, you will need to know not only the amount of money available for your research, but the stability of the funding.
3. **How does your prospective Major Advisor's lab operate?** You should critically evaluate the day-to-day operations of the lab and understand the goals of the lab and where you will "fit in". You should also understand the role of your Major Advisor in those operations. Some principal investigators have lab managers or research assistants who run the laboratory. You should know almost as much about these individuals as about your prospective Major Advisor.
4. **What are the professional requirements of the prospective Major Advisor on such issues as work habits, ethics, sharing of ideas, lab meetings, journal clubs and authorship on papers?**

On the personal side, the answers to the following questions may be extremely helpful:

1. **Is the personality of my prospective Major Advisor compatible with my own?**
2. **Is this individual going to be responsive to my needs and just as important am I going to be responsive to his/her research needs?** When you join a lab, your Major Advisor will have certain expectations of you, and these should be identified when evaluating a prospective Major Advisor. By the same token, what are your expectations of your Major Advisor?
3. **What do other students and faculty think about your prospective Major Advisor?** The collegial relationship of your prospective Major Advisor with others will influence your interaction with other laboratories.

Do not forget the importance of the choice of a Major Advisor and do not make that choice without a great deal of thought. Talk to other people about your prospective Major Advisor by asking probing but not inflammatory questions. Also, provide yourself with honest answers to both the professional and personal aspects of your decision. Once you have identified a Major Advisor, the ACBS Director of Graduate Studies must be informed of this selection in writing by you and your Major Advisor.

Appendix III

Master of Science (Non-Thesis Option)

Students pursuing a MS degree in the Animal & Comparative Biomedical Sciences Grad Program, who are interested in the Racetrack Program (RTIP) or Equine or Beef Management, can petition to pursue a non-thesis option. This option has an emphasis on preparing students for professional opportunities in animal agriculture-related business. The non-thesis option includes a professional development project generated through internship or applied, business-related research. The non-thesis option is **NOT** designated to prepare students for advancement into a Ph.D. program.

Course Requirements

A minimum of 30 units of graduate credit are required. All the units of coursework in the major field of the student must be at the 500 level or above and can be applied to the program of study. One half of the required units must be in courses in which regular grades (A, B, C) have been earned (i.e., no more than half the units can be graded S or P). Courses that earn a D or E cannot be counted toward degree.

Students must complete a minimum of 3 units of Statistics, 3 units of business coursework and 2 units of seminar (ACBS 696A or ACBS 696B for RTIP students). Additional requirements for completion of the degree will be determined by the Major Advisor and the Graduate Advisory Committee.

Students transferring to the University of Arizona with graduate credits from other institutions can petition that up to 12 graduate credits are applied to the major in this program. However, only graded courses are acceptable, and the transfer credits must be approved by the ACBS Graduate Committee. If the student is transferring courses, he/she will need to fill out the ***Evaluation of Transfer Credit Form*** via GradPath.

Major Advisor and the Graduate Advisory Committee

Upon acceptance each student is assigned a Major Advisor in the area of the student's interest. The Major Advisor must be a tenure-track faculty member (Assistant Professor, Associate Professor, or Professor) and will assist the student in the selection of their Graduate Advisory Committee. The student's Graduate Advisory Committee will consist of their Major Advisor and two other faculty members. The two additional committee members must meet the following qualifications:

- At least one member must be an Animal & Comparative Biomedical Sciences Faculty
- At least one needs to be a tenure-track faculty member

If one of the two additional members of the committee is not a current tenure track member, he or she must be approved by the Graduate College as a special member. If the student needs to get a Special Committee Member approved, they need to contact the ACBS Graduate Coordinator as soon as possible. The ACBS Graduate Coordinator will initiate the process and fill out the necessary forms with the Graduate College for approval of the special member.

The Major Advisor and the Graduate Advisory Committee will supervise curriculum development and the professional development project. The Graduate Advisory Committee will also be responsible for the approval

of the project report and for the final examination. Once the Graduate Advisory Committee is selected the student should submit the ***Master's/Specialist Committee Appointment Form*** via GradPath.

Plan of Study

In conjunction with his/her Major Advisor, each student is responsible for developing a Plan of Study, during the first few months in residence. This Plan of Study is to be submitted to the Graduate College no later than the second semester in residence.

All deficiencies must be satisfied before the Plan of Study is approved. The Plan of Study identifies (1) courses the student intends to transfer from other institutions; (2) courses already completed at the University of Arizona that the student intends to apply toward the graduate degree; and (3) additional course work to be completed to fulfill degree requirements.

Once the Plan of Study has been agreed upon by the student and their Graduate Advisory Committee, the student should submit the ***Plan of Study form*** via GradPath. After submission, the Plan of Study must have the approval of the following people in this order: The ACBS Graduate Coordinator, Major Advisor, ACBS Director of Graduate Studies, and lastly the Graduate College (Degree Counselor). All approvals are completed in GradPath. Once the ACBS Graduate Coordinator has approved the Plan of Study, he/she will notify the student, and it is their responsibility to notify their Major Advisor to do the same.

There is a Fee associated with the submission of your Plan of Study

Academic Performance

The Graduate College Policies and Procedures state that "No student will be recommended for award of an advanced degree unless he/she has achieved a grade average of 3.0 or better on: (a) all coursework taken for graduate credit and (b) all coursework included specifically in his graduate program." It your responsibility to understand that any student who fails to achieve a GPA of 3.0 for two consecutive semesters is at risk of being disqualified from the program. The Graduate Advisory Committee of such a student should meet at the earliest possible time to determine whether a student should be continued on in their degree program or withdrawn from the program.

Teaching Component

Generally, for the M.S. Non-Thesis option, there is no teaching component required. However, this can vary from student to student.

Professional Development Project

A professional development project (minimum of 6 units of credit) is required for all students in the Non-Thesis option. The project will be based upon an internship, special problem or research activities that facilitate the student's preparation for employment in agribusiness. A professional development project report must be submitted to and approved by the student's Graduate Advisory Committee. After making any required corrections, the candidate submits two copies (one to the ACBS Graduate Coordinator and one to the Graduate Advisory Committee) on or before the date specified in the Graduate College's Calendar for the candidates. ***Non-Thesis MS Students follow the same deadlines as Thesis MS students*** (UA Graduate College Important Deadlines)

Final Examination

A candidate for the Master's degree (Non-Thesis option) must present a seminar on their professional development project and must pass a final oral examination administered by the student's Graduate Advisory Committee. The examination will cover the project and general topics in the field of study. The result of the examination must be reported to the Graduate College within two weeks. To report the completion of a degree, the Major Advisor must first notify the ACBS Graduate Coordinator. The Graduate Coordinator will then submit a ***Master's/Specialist Completion Confirmation Form*** on behalf of the student, which will then be forwarded to the ACBS Degree Counselor (Graduate College) for finalization.

Any candidate who fails the final examination may, upon the recommendation of the major department and approval of the Graduate College, be granted a second examination after a time period of at least one semester. The report of successful completion of all requirements (Report on the Final Examination and the Completion of Requirements for the Master's degree) must be made to the Graduate College at least four weeks before the date on which degrees are awarded, and the student must be registered during the semester in which they graduate.

Appendix IV

The Faculty-Graduate Student Relationship

Introduction

Mentoring is an essential part of graduate education. In fact, in many ways, mentoring is the "heart" of graduate education. The Major Advisor is responsible for ensuring the student becomes sophisticated in a discipline or field of study, is challenged intellectually, learns how to think critically and aspires to create new knowledge. In addition, the Major Advisor is responsible for assisting the student in developing the interpersonal skills needed to succeed in the discipline.

Mentoring is distinct from advising because it involves a personal relationship. This relationship includes faculty acting as close, trusted, experienced guides and advocates. The nature of the mentorship relationship is different for each student and depends on experience, personal needs and background (e.g. age, gender, ethnicity, and culture). It recognizes that graduate school includes socialization to the values, norms, practices and attitudes of a discipline.

Mentoring gradually transforms the student into a colleague. It produces opportunity and growth for both the mentor and the student.

The task of mentoring is multifaceted. "Mentors are advisors, people with career experience willing to share their knowledge; supporters, people who give emotional and moral encouragement; tutors, people who give specific feedback on one's performance; information about and aid in obtaining opportunities; models, of identity, of the kind of person one should be to be an academic." (Zeldithc, M., 1990, "Mentor Roles" Proceedings of the 32nd Annual Meeting of the Western Association of Graduate Schools). These characteristics of mentors combine to provide a broad-based nurturing of the professional and personal development of the graduate student.

The Graduate Council expects that each entering graduate student will choose a Major Advisor soon after their arrival to the University of Arizona. Early stages of a program of study require many decisions on the part of the student, so it is important that the counsel of a Major Advisor be available from the very beginning. The Major Advisor is expected to interact with the student on a regular basis, providing guidance, advice and intellectual challenge necessary for the student to complete his or her program. It should be recognized that the specific Major Advisor and the mentorship role may change over time. Thus, a student may have more than one mentor during the course of a degree program. In practice, a student may have more than one mentor at any given time. That is, although the student may choose a single faculty member as the Major Advisor, other individuals may play significant mentoring roles for the student. In fact, having multiple mentors is desirable.

Mentoring is essential to student retention and the quality of the student's program of study. The Graduate Council expects that each degree-granting unit will have in place a well-defined and active mentoring program, and that it will be reviewed on a regular basis to ensure its effectiveness. New faculty members should be instructed about the mentoring process during their new employee orientation. Recognizing that mentoring is such an essential part of faculty responsibility, the Graduate Council expects that it will be considered in all

faculty merit evaluations and tenure-promotion decisions. Further, the Graduate Council acknowledges that although this position paper is geared mainly toward the mentoring of graduate students, faculty responsibilities for post graduate mentoring (i.e. for postdoctoral students) should follow many of the same principles.

Activities that are important components of the faculty-student mentoring relationships are discussed below. The Graduate Council recognized that the importance of each of these activities will vary with discipline, type of degree being pursued and time as the student progresses through his or her program of study. The activities described here are intended to be suggestions. They represent dimensions of a good mentoring program. However, in the final analysis, the role of the Major Advisor as a mentor, supporter, tutor, sponsor and role model will be more than the sum of these activities and will be highly individualized.

The activities discussed are divided into three parts. The first considers some of the responsibilities of the faculty member and the ACBS Program. The second considers some of the responsibilities of the student. The third considers the formal academic experiences that are relevant to mentoring. (For the purposes of this handbook, the responsibilities of the ACBS Program have been omitted.)

Responsibilities of the Graduate Student

Take Charge of the Program of Study

The graduate student is an active part in the mentoring relationship. The student should keep in mind the responsibilities of the Major Advisor and the ACBS Program discussed above, but at the same time takes final responsibility for tailoring his or her Program of Study. Thus, while seeking guidance from a mentor, the student should make sure the program of study meets his or her needs. The student should keep track of requirements and deadlines. In particular, the student should be well informed about the policies and procedures which can be located using the Graduate College Website. He or she should be self-motivated and take initiative to capitalize on education opportunities. It is important that the student strive to be as independent as possible, though recognizing that independence will increase over the course of the program of study. The student should consult often with student peers who have gone through the various stages of a program of study and seek options about the pros and cons of the various options available.

Appraise Mentor of Progress and Problems

Communication with the Major Advisor is essential. The student should keep the Major Advisor fully informed of his or her program status. It is important that the student tell the Major Advisor as soon as problems arise. The student should be honest and open in sharing information. The Major Advisor may have solutions for many of the student problems or know what resources are available to assist with problems.

Contribute Knowledge

Students tend to see themselves as on the receiving end in the mentoring relationship. It should be remembered, however, that the student has a great deal to offer to the mentor. The student should contribute to the knowledge base of the mentor, peers, and program. The act of contributing will boost self-esteem, gain additional respect and stimulate the surrounding intellectual environment. Good Major Advisors envision that their students will ultimately surpass them. Thus, good Major Adviosrs, welcome contributions from students and value them as indication of their success as teachers.

Seek Multiple Mentors

It is unlikely that one mentor can fulfill all of the student's needs. Therefore, the student shall seek out multiple mentors during his or her program of study. These may be chosen to fulfill different intellectual needs, provide specific training opportunities in various skills (e.g. certain laboratory techniques) and obtain emotional support. The search for appropriate mentors need not be restricted to faculty members. Other graduate students can provide significant mentoring experiences. Postdoctoral students, in particular, are often a rich resource for mentoring activities.

Change the Relationship if Necessary

For one reason or another, not every faculty-student mentoring relationship will be the best match. If the student believes the mentoring relationship is not satisfactory, then it may be appropriate to terminate the relationship and find another Major Advisor. Or, in the case of where the student may change the area of emphasis in the program of study, it may be beneficial, or even necessary, to seek another Major Advisor. There are perfectly good reasons for the entire program of study to be under a single Major Advisor. However, when a change in mentors may seem appropriate, the student should discuss it with the Major Advisor and those who might assume the role as the Major Advisor.

Formal Academic Experiences

Certain formal academic experiences fit well into the faculty-student mentoring relationship. Four are briefly discussed here as examples that Major Advisors and departments may find them useful in the mentoring process.

Introduction to the Discipline

The introduction-to-the-discipline or core course is usually designed to bring together all the first-year graduate students on a regular basis. Typically, it entails meeting at least once a week with one or two faculty members who supervise the course. Students may discuss with faculty the appropriate journals within the discipline and obtain insights concerning the evaluating and reporting of published literature. Student may make oral presentations, followed by critiques from faculty and other students. They may engage in generic discussions about various subdivisions of the discipline. Or they may be involved in other activities that provide a broad understanding of the discipline.

Independent Study or Tutorial

An independent study or tutorial is designed to foster faculty-student interaction and to guarantee that the student obtains breadth of knowledge in a variety of areas within his or her discipline. Several independent studies may be completed prior to the preliminary examination. The student typically meets with the faculty member on a regular basis. Such meetings may be used for in-depth discussions of designated topics. Independent studies may involve reading assignments, library work or other relevant activities.

Presentation Seminar or Colloquium

It is important in the preparation of students for professional activities that they gain experience in giving presentations of their own work in front of general audiences. Toward this end, it is a requirement in many departments that each doctoral student (and in some cases master's student) give at least one seminar each year after the first year in residence. ***In the ACBS Graduate Program, it is a requirement that all students (MS or PhD) present at least 2 times during their degree program and are required to attend all seminars, when not presenting.*** The goal is to provide the student with an opportunity to learn how to present material publicly.

As such, the seminar presentation prepares the student for presentations at professional meetings, job interviews, or other speaking situations in the discipline. Student seminars also foster collegiality.

Laboratory Rotation

In certain disciplines, the laboratory rotation is an important formal academic experience. In a laboratory rotation, the student spends an extended period of time conducting research in the laboratory of a designated mentor. The typical student will rotate through several laboratories during the course of a program of study, giving him/her a breadth of experience and providing information that may be useful in the task of choosing a thesis or dissertation Major Advisor. The laboratory rotation is an important mechanism because it provides the student with hands-on experience and the opportunity to interact with several faculty members within the discipline.

Summary

The Graduate Council believes that every department should have in place a structured mentoring program and that this program should include an appropriate infrastructure (e.g. practices, procedures, courses) to integrate students into the discipline fully. Strong mentoring increases student satisfaction, improves student retention, decreases the time-to-degree and produces a higher quality graduate. Mentoring is at the heart of graduate education. The Graduate Council urges that it be encouraged, practiced and fostered at the University of Arizona.

Appendix V

Laboratory Rotation

Student: Date:

Before starting the rotation, the student and mentor must submit to the ACBS Graduate Committee a brief outline of the anticipated timeline of the rotation, and the work to be performed. Upon completion of the rotation, the student and mentor should submit a one paragraph summary of the work and training accomplished. The student and mentor must also each submit, on separate forms, a confidential evaluation of the rotation.

Outline of the Evaluation:

Signatures

Major Advisor: _____Date: _____

Student:_____ Date: _____

Appendix VI

Guidelines for Graduate Teaching and Research Assistants/Associates

As one of the leading research universities in the nation, with over 300 outstanding graduate programs, the University of Arizona employs nearly 3,000 graduate students each year. Graduate assistantship/associateship (GA) positions at the University of Arizona are very competitive and we encourage any student interested in a GA position to inquire. GA positions at the University of Arizona are designed to:

- Provide employment and employment benefits to our students while they work to complete their graduate degree.
- Recruit exceptional students to our many graduate programs.
- Provide support to various colleges and departments on campus in fields such as teaching, research, outreach, etc.
- Provide hands on learning which allows the student to develop various educational and professional skills. Allowing the graduate student to gain an exceptional, varied, and valuable university experience.

Graduate assistants/associates may also have various job titles at the University of Arizona. Each title may have different duties and responsibilities associated with it. Please consult with the hiring department for further clarification of the duties and responsibilities associated with a particular job title. Please note that the title of Graduate Associate is reserved for doctoral degree seeking students only.

If you wish to apply for an assistantship/associateship position, please contact the department that you would like to work for regarding available positions. For academic departments, the best contact is usually the Graduate Coordinator. For non-academic departments, the best contact is usually the business manager.

All employees at the University of Arizona, including graduate assistants/associates, must undergo a pre-employment screening process in accordance with ABOR policy 6-709.

Board of Regents' Mandate

At its October 1985 meeting, the Arizona Board of Regents (ABOR) adopted the following policy:

1. Each university will develop and maintain programs to provide training in basic teaching methods and skills for graduate teaching assistants/associates.
2. Each university will require an appropriate regular faculty member formally assess the teaching performance of each graduate teaching assistant and associate every semester, and then submit a written report of the assessment to the department chair and to the graduate teaching assistant or associate
3. Each university shall require the department chair or other appropriate administrator to certify in writing each graduate assistant or associate has clearly demonstrated a high level of oral and written skill in English necessary for effective classroom teaching.

Status and Definitions

Primary Lecturer: Graduate teaching assistant (GTA) is responsible for syllabus and materials design, course planning, and grading, under supervision

Discussion Leader: GTA attends and participates in a large lecture course and is responsible for leading a small recitation or discussion sections.

Assistant Lecturer: GTA works in the classroom with or under the close supervision of a faculty member. He or she is responsible for a substantial portion of class lecturers.

Grader or Scorer: GTA has little or no contact with students but is responsible for scoring or grading assignments submitted to primary professor.

Lab Assistant: GTA is responsible for instruction in a laboratory in fields such as science and engineering, or in a practical field such as music.

Research Assistant/Associate (RA): Graduate student assists a faculty member with academic research.

International Teaching Assistant/Associate (ITA): The Graduate Council Guidelines provides specific policies for training, supervision, and evaluation of GTAs and RAs for whom English is not the first language.

Terms of Appointment

A Graduate Assistant must be currently enrolled in a graduate degree program at the University of Arizona and must maintain a 3.0 cumulative GPA for all University–Level Graduate courses. A Graduate Associate must be a student enrolled in a doctoral degree program at the University of Arizona and has either a Master's degree or 30 units toward a doctoral degree, and must also maintain a 3.0 cumulative GPA for all University-Level Graduate courses. Students must be recommended by a department in order to receive an appointment. See "Academic Eligibility" for more information. The workload hours range over five categories: ¼ time to ¾ time (20-60 hours/pay period). All assistants are required to carry a minimum of 6 units of graduate credit (for the Fall and Spring semesters) ranging around 10-16 hours depending on the number of hours of work. Non-residents of Arizona are eligible for non-resident tuition waivers. See "Enrollment Status and Limitations"

<u>Academic Eligibility</u>

Each student must meet specific eligibility requirements in order to be considered for and obtain a Graduate Assistant/Associate position. Each student must:

- Be admitted to a graduate degree seeking program (Certificate only programs do not satisfy this requirement. Furthermore, Law, Medicine and Pharmacy students are not normally eligible for GA positions unless concurrently enrolled in a regular degree seeking program).
- Have a minimum GPA of 3.0 (If a student is newly admitted, the admission GPA is considered for this requirement). A student must also maintain a minimum GPA of 3.0 during their employment.
- Be enrolled in at least 6 graduate level units for credit (undergraduate, outreach, or audited courses do not satisfy this requirement). Hiring departments may require a higher enrollment.

Graduate Associates must, in addition to the above:

- Be enrolled in a doctoral program with either a Master's Degree or 30 units graduate level credit toward a Doctoral Degree at the University of Arizona.

- Retain associate status unless converted to a Non-Doctoral Degree Program as a Graduate Assistant or change hiring departments.

Employment Status and Limitations

Graduate Assistants/Associates are classified as student employees. As such, they are:

1. Limited to no more than 30 hours per week total campus employment (including supplemental compensation) during periods of enrollment to maintain student employee status. Employment for International Students on a F-1 or J-1 Visa must be limited to 20 hours per week while school is in session (summer session is voluntary and is not limited). This is a federal regulation and the program is responsible for adhering to it. For any questions regarding this regulation, please contact International Student Programs and Services, 621-4627.
2. Exempt from deductions for Social Security taxes (FICA) during semesters or summer sessions when officially enrolled. Minimum enrollment for the exemption is six (6) units per semester for the Fall/Spring semesters or three (3) units per Summer session.
3. Not eligible for participation in the University of Arizona employee benefits program or the State of Arizona Retirement Program.
4. The maximum number of hours per week employment, within the 30 hours/week allowable, varies by enrollment status. Please see the chart on the following page for specific limits. Officially audited courses, dissertation, thesis, undergraduate courses, and supplementary registration are included in this total.
5. Students may hold appointments at GTAs in a maximum of two (2) departments, simultaneously.

According to the Arizona Board of Regents' policy, Graduate Assistants/Associates are not eligible for concurrent employment as faculty or staff. They may, however, be eligible for additional compensation on Supplemental Compensation.

Enrollment Limitations

Academic Year (Fall and Spring Semesters)
Minimum enrollment: Graduate Assistants/Associates are required to enroll in and complete, a minimum of six (6) units of graduate credit each semester, or a higher number if required by the college. Undergraduate and/or official audited courses are not included in this total.

Maximum Enrollment: Maximum unit loads vary depending on the total hours of employment (salaries and supplemental compensation) as follows. Officially audited courses, undergraduate courses, dissertation, thesis, and supplementary registration are included in this total.

Summer Session:
Minimum enrollment: Graduate Assistants/Associates are not required to enroll during the summer session to maintain student employment. GTAs who are not enrolled, or are enrolled for less than three (3) units per session will have social security (FICA) taxes withheld from their paychecks.

Additional Requirements for Graduate Assistants/Associates in Teaching

No Commercial Activity: The Graduate Council has ruled that GTAs not be allowed to engage in any commercial activity relative to the course with which they are assisting at this University (e.g., selling course materials or conducting paid review sessions for courses in which they are directly involved as a GTA).

Assignment to Graduate Level Courses: GATs may not be the instructor of record for classes giving graduate credit. Duties of GTAs involved in graduate level classes should be restricted to non-subjective grading, lab setup, website maintenance, and general advising.

Training: All GTAs must complete training assignments before assuming direct instructional responsibilities at the University of Arizona. Any GTA who fails to comply with all the requirements will be violating the conditions of employment agreed in the Notice of Appointment for Graduate Assistants/Associates and may not engage in direct instructional contact.

Minimum Training Requirement

All Graduate Assistants/Associates with the title of "Graduate Teaching Assistant/Associate," must complete the following two mandatory trainings prior to the beginning of employment:

Teaching Assistant/Associate Training Orientation (TATO)

Teaching Assistant/Associate Training Online (TATO) is a collection of self-paced modules about teaching and learning. These modules are made available via Brightspace. All students who wish to be employed as Teaching Assistants/Associates (TAs) must complete "*Staying Out of Trouble: UA Policies*" and pass the test with a score of 95% or higher no later than two weeks after the start of classes. After completing *"Staying Out of Trouble: UA Policies"*, it is recommended that TAs review this information before the beginning of each semester. There are also additional duty-specific modules have been found to be very helpful in providing suggestions and tips for effective teaching. They can be accessed at any time.

For more information visit: https://grad.arizona.edu/funding/gaships/mandatory-online-training

English Proficiency

An International Graduate Teaching Assistant/Associate from a non-English speaking country must demonstrate fluency in spoken English. A passing score on any one of the approved tests is sufficient to qualify for a position. Please note that previous attendance at an English-speaking institution does not satisfy this requirement.

Tests that satisfy the requirement are listed below, along with their minimum passing scores. A passing score from any one of these tests will satisfy this requirement:

- TBEST- Minimum passing score is 6.8
- IBT TOEFL- Speaking section minimum passing score is 24
- TSE/SPEAK- Minimum passing score is 50

Please note that the TSE/SPEAK and TBEST exams are no longer administered, but will be accepted as long as the minimum passing score was met.

For more information on English Proficiency Evaluations please visit: hhttps://grad.arizona.edu/funding/gaships/english-speaking-proficiency-evaluation

Departmental Reporting Requirements

TA Training Record: Training records are due shortly after the beginning of each regular semester. This report provides the Graduate College with a list of the GTAs' class assignments, duties, and name(s) of the supervising professor(s). A sample, summary, and copy of the departmental training material must be submitted with the Fall training record.

TA Evaluation: Evaluations are due at the end of each regular semester and notifies the Graduate College of the quality of the GTAs' performance and fitness for reappointment. GTAs without a current evaluation on file are not eligible for rehire as a GTA. GTAs receiving low evaluations are not eligible for rehire without prior Graduate College approval.

For any questions/concerns regarding GTA training, please contact Julie Treanor at treanorj@arizona.edu

Supervision

Each teaching assistant must be assigned to a faculty member who is responsible for his or her supervision. The faculty supervisor shall provide guidance and direction for the graduate assistant throughout the semester. Faculty supervisors are responsible for evaluating the teaching assistant's performance and the classroom/laboratory environment where he or she teaches and for submitting a complete written evaluation to the Director of the School of Animal and Comparative Biomedical Sciences. Evaluations are then made available to the Graduate College.

Supervisors are committed to the creative and ongoing development of effective pedagogical teaching strategies and effective teachers. Supervision should include, but not be limited to:

1. Direct observation of the GTA in a classroom or laboratory setting
2. Review of his/her instructional responsibilities
3. Review of developmental and use of instructional methods
4. Scheduling follow-up meetings at regular intervals throughout the semester to discuss problem areas and ways to improve his/her teachings

Evaluations

Evaluation and feedback are crucial components of effective teaching and should include both faculty and student input based on the supervisor's direct observation. Feedback from supervisors can serve to improve teaching skills. Faculty supervisors are responsible for evaluating the GTA's performance and the classroom/laboratory environment where he or she teaches, as well as the use of instructional materials. Faculty supervisors are responsible for submitting complete individual evaluation forms for each GTA to the departmental administrative assistant, to be forwarded to the Graduate College with the Program report at the end of the semester when final grades are due. The supervisor's evaluation shall include a summary of the student's evaluations of the GTA.

GTAs whose performance is scored "low" by their supervisors during the first semester are required to undergo additional training by the department of the UTC before the beginning of the second semester or very early in the second semester. GTAs who show no improvement in their teaching by the end of the second semester will

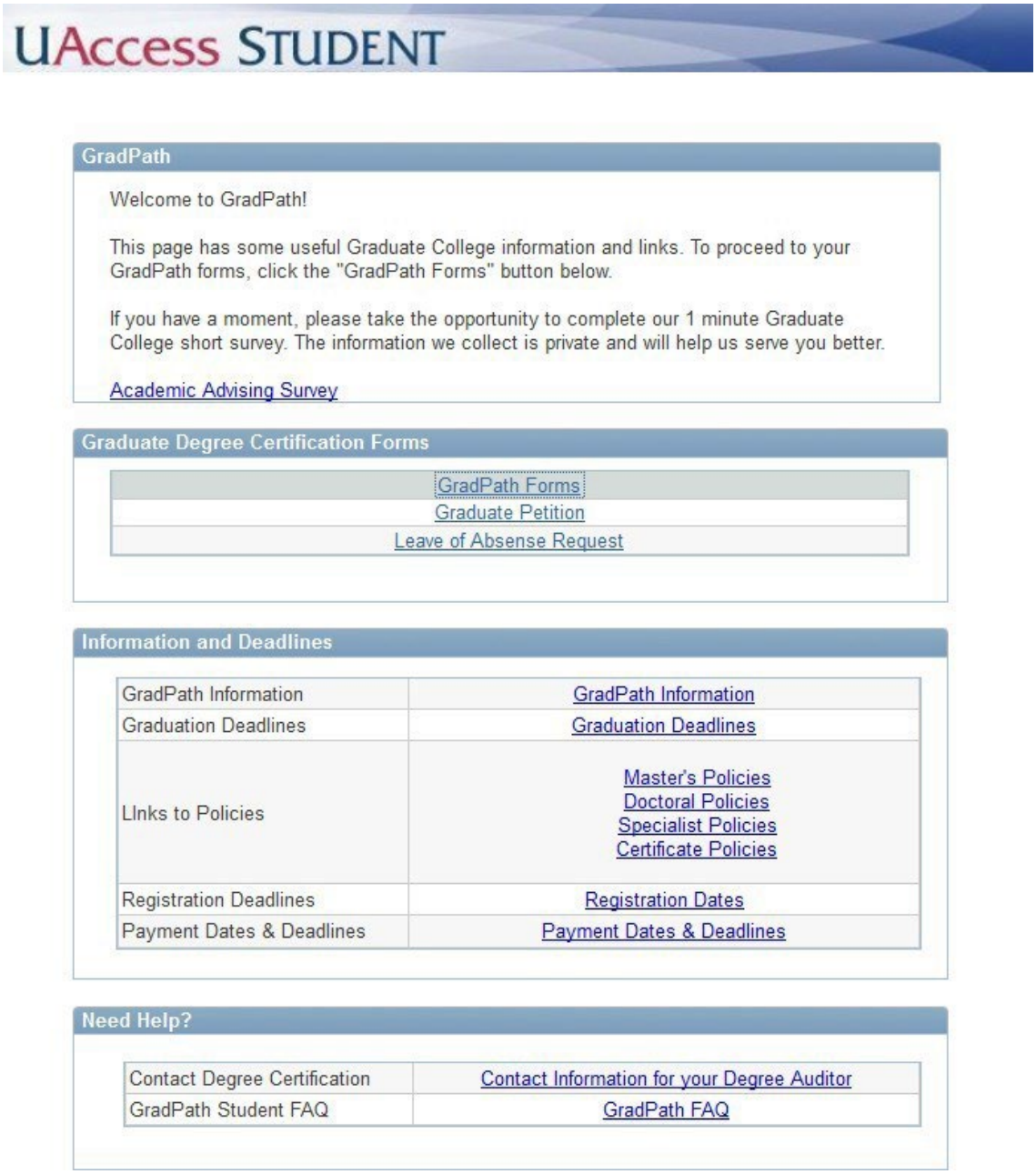
not be eligible to continue on a teaching assignment. Additionally, GTAs whose graduate GPA falls below a 3.00 are also not eligible for further appointments.

GTA performance evaluations may be appealed to the Director and, if not resolved at this level, to the Dean of the Graduate College. Appeals will not be considered beyond the Dean's level, except in any cases which allege unlawful discrimination. Such complaints must be filed in the Equal Opportunity and Affirmative Action Office. For more information of Graduate Assistant/Associate positions, please see the GA Manual on the UA Graduate College website, https://grad.arizona.edu/funding/gaships smanual.

Appendix VII

UA GradPath (MS Degree)

Forms are completed and submitted electronically. GradPath is the Graduate College's nearly paperless degree audit process that will make submission and approval of all necessary forms much easier. Students fill-out and submit forms online through UAccess Student. Once a student is logged into UAccess from the main page of their Student Center, the student clicks the drop-down menu (it reads other academics in the box) and scrolls down until they find "GradPath Forms". After the student clicks the link, it should bring them to this landing page:

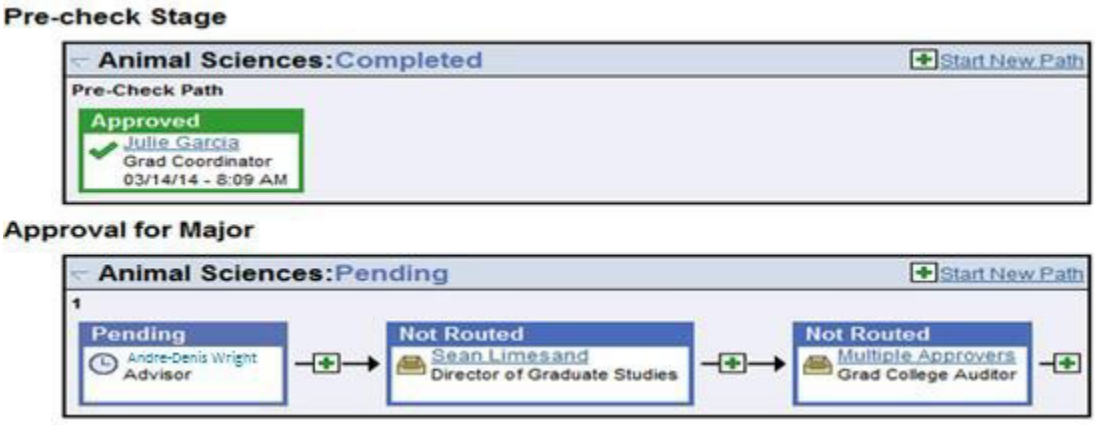


To access GradPath the student must click on the GradPath Forms Link. The student can check the status of forms at any time. GradPath lets students know what forms next need their attention (See below).

The following forms must be filled out by the Master's Candidate via GradPath, unless otherwise noted:

- Evaluation of Transfer Credit (If applicable)
- Master's/Specialist Plan of Study
- Master's/Specialist Committee Appointment Form--needs to be submitted by every Master's/Specialist student whether or not that student has a committee.
- Master's/Specialist Completion Confirmation Form—The Graduate Coordinator will submit this form on behalf of the student
- Exit survey

Forms have some automatic checking built-in that will prevent common errors (e.g., typos in course numbers, illegible faculty names, etc.). There is also some built-in logic to notify Students/Major Advisors/Graduate Coordinators when there is a problem with a form, such as courses outside the time limit. Such messages include links to policy. Then the automated workflow engine will route the electronic forms to everyone who needs to see or approve them. The following diagram is an example of the routing approval path:



The timeline that these need to be submitted by can be found at Graduate College Website by going to Home > Degree Services > Degree Requirements > Important Degree Dates and Deadlines.

UA GradPath (Ph.D. Degree)

Forms are completed and submitted electronically. GradPath is the Graduate College's nearly paperless degree audit process that will make submission and approval of all necessary forms much easier. Students fill-out and submit forms online through UAccess Student. Once a student is logged into UAccess from the main page of their Student Center, the student clicks the drop-down menu (it reads other academics in the box) and scrolls down until they find "GradPath Forms". After the student clicks the link, they should be brought to this landing page:

GradPath

Welcome to GradPath!

This page has some useful Graduate College information and links. To proceed to your GradPath forms, click the "GradPath Forms" button below.

If you have a moment, please take the opportunity to complete our 1 minute Graduate College short survey. The information we collect is private and will help us serve you better.

Academic Advising Survey

Graduate Degree Certification Forms

GradPath Forms
Graduate Petition
Leave of Absense Request

Information and Deadlines

GradPath Information	GradPath Information
Graduation Deadlines	Graduation Deadlines
LInks to Policies	Master's Policies Doctoral Policies Specialist Policies Certificate Policies
Registration Deadlines	Registration Dates
Payment Dates & Deadlines	Payment Dates & Deadlines

Need Help?

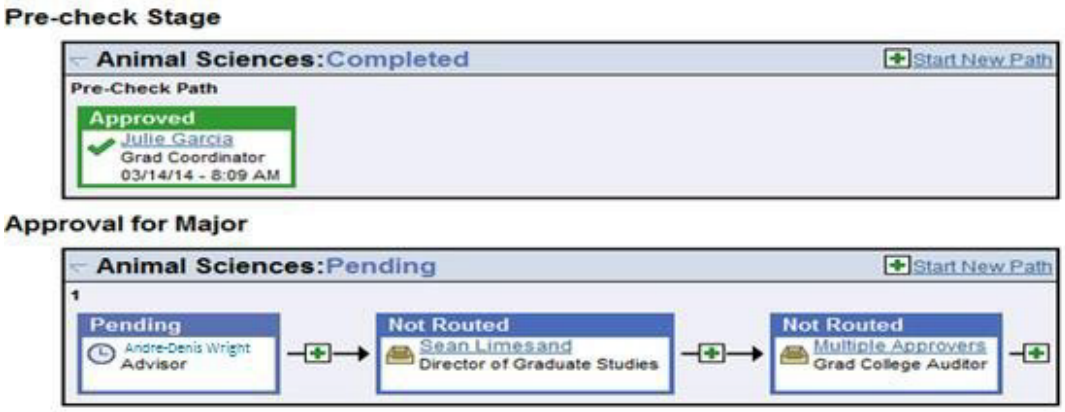
Contact Degree Certification	Contact Information for your Degree Auditor
GradPath Student FAQ	GradPath FAQ

To access GradPath the student must click on the GradPath Forms Link. One can check the status of particular forms at any time. GradPath lets students know what forms next need their attention (See below).

The following forms must be filled out by the Doctoral Candidate via GradPath, unless otherwise noted:

- Responsible Conduct of Research Form
- Evaluation of Transfer Credit (If applicable)
- Doctoral Plan of Study
- Comprehensive Exam Committee Appointment Form
- Announcement of Doctoral Comprehensive Examination
- Results of the Oral Comprehensive Examination for Doctoral Candidacy (submitted by committee chair)
- Verification of Prospectus/Proposal Approval (submitted by Graduate Coordinator)
- Doctoral Dissertation Committee Appointment Form
- Announcement of Final Defense
- Results of Final Defense (submitted by committee chair)
- The Submission Process

Forms have some automatic checking built-in that will prevent common errors (e.g., typos in course numbers, illegible faculty names, etc.). There is also some built-in logic to notify Students/Major Advisors/Graduate Coordinators when there is a problem with a form, such as courses outside the time limit. Such messages include links to policy. Then the automated workflow engine will route the electronic forms to everyone who needs to see or approve them. The following diagram is an example of the routing approval path:



The timeline that these need to be submitted by can be found at Graduate College Website by going to Home > Degree Services > Degree Requirements > Important Degree Dates and Deadlines.