

Animal & Comparative Biomedical Sciences Graduate Student Handbook

**The University of Arizona - College of Agriculture and Life 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 and seek advice.

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 Program 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>.

If you have any questions or face any problems, please do not hesitate to contact me, the Graduate Program Coordinator, or any member of the Graduate Program Executive Committee.

Best Wishes,

Ravi Goyal, MD, PhD

Associate Professor and 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 located in the Animal and Comparative Biomedical Sciences (ACBS) Building at the main campus of the University of Arizona. Laboratories are located in the ACBS and Shantz building, Agriculture Research Complex and Bio5 facility. These laboratory facilities provide modern equipment to support the research activities of the graduate faculty. Animal research units are located in Tucson at the Campus Agricultural Center and West Campus Agricultural Center. Additionally, research units can be found near Camp Verde, AZ at the V-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, 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. An addition (December 2012) to the Campus Agricultural Center is the creation of a teaching farm.

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 and Life 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 and Life 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.

Because the V Bar V is a fully operating, working ranch, applied research is the primary aim. Faculty, staff, and students are able to 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.

2022-2023 Graduate Committee

Director of Graduate Studies:

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Faculty & Research Interests

Fernando Aranguren (lfarangu@arizona.edu or 520-621-8082) *Assistant Research Professor – Ph.D., Arizona, 2011.*

Dr. Aranguren has over 25 years of professional experience working mainly on aquatic animal health, including shrimp and fish diseases, diagnostics, health management, sanitary legislation, and biosecurity.

Joslyn Beard (joslynbeard@arizona.edu or 520-626-9532) *Assistant Professor, Livestock Extension Specialist – Ph.D., Univ. of Nebraska, 2020*

Zelieann Craig (zr.craig@arizona.edu or 520-621-8082) *Associate Professor – Ph.D., Arizona, 2009.*

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) *Associate Professor and Director, Aquaculture Pathology Lab (APL)- Ph.D., 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 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) *Associate 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 Heart 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) identify 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.

Frank Duca (faduca@arizona.edu or 520-626-9965) *Assistant Professor – Ph.D., Paris IV, 2013.*

Research interests are to understand the role of the gastrointestinal tract, and its microbial inhabitants, in the development of obesity and diabetes. Current work is focused on better understanding the ability of the gastrointestinal tract to provide post-ingestive feedback via a gut-brain axis to regulate glucose homeostasis and food intake. In addition, the lab is also very interested in how the gut microbiota plays a role in energy and glucose homeostasis in both normal and diseased states. The lab is exploring how varying environmental factors (diet, housing, exercise, pre/post-natal environment, etc.) result in differential effects on the gut microbiota, intestinal nutrient sensing, and whole-body energy and glucose homeostasis. Dr. Duca's research studies utilize numerous rodents in-vivo metabolic experiments, as well as in-vitro cell lines and human models, to better understand how the gut impacts metabolic disease, which is crucial for the development of successful, gut-targeted therapeutic options in the treatment of obesity and diabetes.

Samuel Garcia (sgarcia@arizona.edu or 520-318-7021) *Associate Professor of Practice/Manager, Food Products and Safety Lab – Ph.D., Arizona, 2013*

Dr. Samuel Garcia is originally from Southern Arizona and comes from a cattle ranching family. Dr. Garcia attended the University of Arizona and graduated in 2013 with a PhD in Animal Science specializing in Meat Science. He currently serves as a faculty member in the UA School of Animal and Comparative Biomedical Sciences.

As an Associate Professor of Practice, at the University of Arizona, Dr. Garcia teaches various courses in the area of Animal Science. The courses taught by Dr. Garcia range from intro level courses to advanced senior level courses. In addition to his teaching duties at the University of Arizona, he has been an adjunct faculty member at Pima Community College in the Culinary Arts Program.

Dr. Garcia also holds the position of Manager of the UA Food Product and Safety Lab. Dr. Garcia directly assists in harvesting, fabrication and processing, and the sale of meat animals. This position allows him the opportunity to interact with and educate rural producers and community members on meat science and harvesting/processing procedures. Dr. Garcia is pleased to serve our Arizona community.

Ravi Goyal (goyalr@arizona.edu or 520-626-5573) *Associate Professor – M.D., Ph.D., University of Mississippi, MS, 2007*

The major research interest of my laboratory group is to study epigenetic regulation of vasculogenesis and angiogenesis. Currently, our group is researching the developmental origin of health and disease with emphasis on fetal programming of metabolic syndrome, cancer, and neurological impairments. Other projects include the development of gene therapy to convert adipose-derived stem cells in insulin-secreting cells as well as developing a suicide gene therapy to target cancer cells. The major approaches the group uses to investigate angiogenesis, stem cell differentiation, and development of targeted cancer therapeutics are aimed at the identification of the novel transcripts, including long non-coding RNA involved in these processes. These transcriptomic regions are then examined with contemporary bioinformatics methods to identify conserved regions in the mouse, sheep, and human genome. Following the identification of the conserved region, we use the CRISPR technique to knockdown or activate these regions to determine their functional implications. We hope to identify molecular targets by which we can increase or decrease angiogenesis, improve stem cell differentiation efficiency, and provide a targeted approach to treat chronic disorders and improve human health.

Sean Limesand (limesand@arizona.edu or 520-626-8903) *Professor- Ph.D. Colorado State, 2000.*

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) *Associate Professor- Ph.D. Queensland.*

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.*

Benjamin Renquist (bjrenquist@arizona.edu or 520-626-5793) *Associate Professor- Ph.D, UC Davis, 2007.*

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).

Koenraad Van Doorslaer (vandoorslaer@arizona.edu or 520-626-9585) *Assistant Professor- Ph.D., New York.*

Papillomaviruses (PVs) are a diverse family of dsDNA viruses infecting most, if not all, amniotes. Papillomaviruses infect cutaneous or mucosal epithelia. While most infections are self-limiting, persistent infection with specific human papillomaviruses has been shown to be the causative agent for cervical cancer. All established oncogenic HPV types belong to a single viral genus (the *Alphapapillomaviridae*). Of note, phylogenetically, these oncogenic HPV types of clusters into a so-called high-risk (HR) clade, indicating an evolutionary relationship between these viruses. Importantly, not all HPV types within this HR clade are associated with cancer.

I am intrigued by the observation that only a limited subset of human papillomaviruses is oncogenic. Throughout my studies I have used a combination of biochemical assays and computational analyses to understand why evolutionarily related viruses differ in their ability to cause cancer in humans.

It is improbable that the ability to cause cancer provides papillomaviruses with an evolutionary advantage. It is likely that many of the viral functions linked to oncogenesis were evolutionarily beneficial as papillomavirus adapted to novel environmental niches on the host (e.g., external genitalia vs. cervix).

Papillomaviruses have evolved to usurp the cellular machinery to complete their life cycle. The papillomaviral lifecycle perturbs the normal differentiation cycle of the infected cell, forcing cells to divide far beyond their normal lifespan. It is feasible that the continued insult provided by replicating viruses eventually results in malignant transformation of the infected cell. However, while persistent infection is key to viral oncogenesis, many long-term persisting viruses do not cause cancer. By carefully interrogating the differences between these viruses, I believe it will be possible to elucidate which viral phenotypes are associated with oncogenic progression. The pathways targeted by these viruses may represent powerful targets for therapeutic intervention

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., Canada, 2014.*

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, 1996.*

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., University of California, 2012.*

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 will be done by The School of Animal and Comparative Biomedical Sciences (ACBS) 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 predications 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 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 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 semesters. 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 in competitions for support (e.g., individual fellowships from outside agencies). If a student is awarded funding from outside agencies, the program and/or mentor 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 stipend can be supplemented (by the advisor) to the level to full support but not from receiving any payment of any kind (lump sum, hourly wages, etc.) from their advisor or other University faculty members in excess of 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 hour 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 involved on thesis or dissertation research. Note: students are expected to work during 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 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 <http://registrar.arizona.edu/gradpolicy/incomplete.htm>. 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 Head of Grad Studies, and includes at least 2 other ACBS faculty members, an Animal & Comparative Biomedical Sciences graduate student representative, and the Program Coordinator. The graduate student representative is elected by the graduate student body of the ANS Grad 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 for the graduate student representative in order to maintain an effective student voice in Program issues.

Student Appeal Policies

A student can appeal any of the aforementioned requirements. The appeal should be made in writing to the Chair 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 Faculty 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 can 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. Award of a TA or RA is a privilege, not a right. Irresponsible actions exhibited while enrolled in the Animal & Comparative Biomedical Sciences Graduate Program and the University risks 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 on-line at <http://grad.arizona.edu/new-and-currentstudents> 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 and Life 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). Student 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 696.***

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

Student transferring to the University of Arizona with graduate credits from other institutions can petition to apply 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 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 Prof., Associate Prof., 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 member

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 Program 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 Program 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 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) on all coursework taken for graduate credit and (b) on all coursework included specifically in his graduate program.”

Any student who fails to achieve a GPA of 3.0 for two consecutive semesters is in very serious academic trouble. 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 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 with 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 this

link: <http://registrar.arizona.edu/personal-information/ferpa-tutorial> (link is external)

TATO (TA Training online)

Teaching Assistant/Associate Training Online (TATO) is a collection of self-paced modules about teaching and learning made available via D2L. All students who wish to be appointed as Teaching Assistants/Associates (TAs) must complete the module "TATO 2016" 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 <http://d2l.arizona.edu> (link is external).
2. Click on the button labeled "UA NetID Login" in the upper left side of the screen. Enter NetID and password.
3. Click on "Self-Registration" in the blue navigation bar near the upper right corner.
Click on the hyperlinked course offering name "TATO 2022".
4. Click on the button labeled "Register"; Click on "Submit"; Click on "Finish".

- When finished, click on "My Home". In the center of the page, find the Student tab and follow the links to complete the TATO module(s).

Deadline

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

Fall 2022 – September 6, 2022

Spring 2023 – January 27, 2023

Activity in TATO and completion of FERPA is monitored by Graduate College staff to ensure completion of this important training. Please contact [D2L Support Team](#) 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 a 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 the copyright for it. Students who may wish to file the 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. Consult your research director 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. In order to report the completion of a degree, the major advisor must first notify the Graduate Program Coordinator. The Graduate Program 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 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.

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 in order to graduate.

For dates by which requirements must be met to graduate in a particular semester, please refer to our [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](#) so they can provide a great student 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 professor 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 one meeting with your Graduate Committee during Year 1.
6. Submit the Annual Progress Report in February (All student who are receiving funding must complete this by Feb 1st)

YEAR 2

1. Submit your Annual Progress Report in February (All student who are receiving funding must complete this by Feb 1st) Make sure you have your 2nd committee meeting by the end of your 3rd semester.
2. 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 Program Coordinator so he/she can fill out the Master's/Specialist Completion Confirmation Form.
3. 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.
 - 3 units of statistical design
 - 3 units of biochemistry
 - 2 units of seminar (ACBS 696). You should present a seminar at least 1 time per year. **During your PhD, you are required to attend all seminars even if you are not registered for ACBS 696.**

You must meet the minimum requirements established for the Master's degree in ACBS.

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 Major Advisors 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 in order 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 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 Program Coordinator, The Major Advisor, The ACBS Graduate Committee Chair and lastly the Graduate College (Degree Counselor). All approvals are completed in GradPath. Once the Graduate Program 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) on all coursework taken for graduate credit and (b) on all coursework included specifically in his graduate program.”

It should be understood that any student who fails to achieve a GPA of 3.0 for two consecutive semesters is in very serious academic trouble. The graduate committee of such a student should meet at the earliest possible time to determine whether a student should continue with their degree program or withdrawn from the program.

Teaching Component

Teaching experience is an important part of graduate training in the ACBSs Program. All graduate students shall participate in the teaching activities of the department in one course per year. All graduate students who will be serving as TAs must complete specific online training modules. Graduate Student Teaching Assistants/Associates (TAs) must complete two pieces of training before they are eligible for employment: FERPA and TATO

FERPA Training

All students are protected by a federal privacy law called FERPA (The Federal Education Right Protection Act). Since TAs are dealing with 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 with 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 this

link: <http://registrar.arizona.edu/personal-information/ferpa-tutorial> (link is external)

TATO (TA Training online)

Teaching Assistant/Associate Training Online (TATO) is a collection of self-paced modules about teaching and learning made available via D2L. All students who wish to be appointed as Teaching Assistants/Associates (TAs) must complete the module "TATO 2016" 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

1. Go to <http://d2l.arizona.edu> (link is external).
2. Click on the button labeled "UA NetID Login" in the upper left side of the screen. Enter NetID and password.
3. Click on "Self Registration" in the blue navigation bar near the upper right corner. Click on the hyperlinked course offering name "TATO 2016".
4. Click on the button labeled "Register"; Click on "Submit"; Click on "Finish".
5. When finished, click on "My Home". In the center of the page, find the Student tab and follow the links to complete the TATO module(s).

Any questions or concerns should be directed to D2L@email.arizona.edu (link sends e-mail).

Deadline

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

Fall 2022 – September 6, 2022

Spring 2023 – January 27, 2023

Activity in TATO and completion of FERPA is monitored by Graduate College staff to ensure completion of this important training. Please contact [D2L Support Team](#) (link is external) 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 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. Both the written and the oral exam will cover major and minor fields of study.

The oral portion must be taken within 2 months of completing and **passing** the written portion. It is recommended that the student arrange a committee meeting approximately six weeks prior to the proposed examination date. At this meeting the student's general research interests, background and projected time table 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 Final Oral 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 Examination

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 questions 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 in order to advance to the oral exam. 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. In order 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.

In order 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 fee for candidacy, dissertation processing, and archiving. This is a one-time fee and the student will not be billed again if they change their anticipated graduation date. Copyrighting is optional and carries an additional fee.

At this time, they 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 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 of 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 dissertation committee, the chair of the committee is to notify the ACBS Graduate Program 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 Program 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 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 needed 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 with 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 in.

Lastly, after the student successfully passes the Final Oral Exam, 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 University Microfilms, Inc ([UMI](#)). 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 (Policies and Procedures>Important 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 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 February (Student receiving funding **must** submit this form no later than February 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 February (Student receiving funding **must** submit this form no later than February 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 February (Student receiving funding **must** submit this form no later than February 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 Program Coordinator so they 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 6th 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 Exam will take place. When then 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 Exam, 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, the final step is to submit the dissertation electronically for forwarding to the Library of the University of Arizona and to University Microfilms, Inc ([UMI](http://www.umi.com)).

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>

Resources for parents, professional development, and health/wellness

<http://grad.arizona.edu/new-and-currentstudents>

UA General Catalog

<http://catalog.arizona.edu>

Academic Integrity

<http://deanofstudents.arizona.edu/codeofacademicintegrity>

Appendix I

Animal & Comparative Biomedical Sciences Graduate Student Annual Report

Student Name:

Degree Sought:

Major:

Minor:

Thesis/Dissertation Title:

Date Submitted:

UA Start Date:

Calendar Year:

Expected Grad Date:

Committee Members

Major Advisor:

Faculty (Major):

Faculty (Major):

Faculty (Minor):

Faculty (Minor):

Additional:

Previous Academic Institutions

B.S.

School:

Major:

GPA:

M.S.

School:

Major:

GPA:

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 (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 (Page 2 of 2)

Publications:

Grants:

Research Progress:

Appendix II

Selecting a Mentor

Each student is expected to select a mentor by the end of their second semester in the program. A mentor is a faculty member who will serve as an advisor, supporter, tutor, master, sponsor and role model. A mentor 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 mentor. The first area has a professional basis and the second a personal basis. The choice of the mentor may be the single most important decision during your graduate career.

When considering the professional aspects of your selection of a mentor 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 mentor's reputation will initially be your reputation.
2. **Does your prospective mentor 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 mentor's laboratory. Also, although your stipend money is relatively stable, the mentor 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 mentor'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 mentor 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 mentor.
4. **What are the professional requirements of the prospective mentor 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 mentor 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 mentor will have certain expectations of you and these should be identified when evaluating a prospective mentor. By the same token, what are your expectations of your mentor?
3. **What do other students and faculty think about your prospective mentor?** The collegial relationship of your prospective mentor with others will influence your interaction with other laboratories.

Do not forget the importance of the choice of a mentor and do not make that choice without a great deal of thought. Talk to other people about your prospective mentor 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 mentor, the Program Chairperson must be informed of this selection in writing by you and your mentor.

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 Race Track Program 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 an 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 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 cannot be counted toward degree.

Student 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 to apply 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 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 Prof., Associate Prof., 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 on the Animal & Comparative Biomedical Sciences Faculty
- At least one needs to be a tenure-track faculty member

If the 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 Graduate Program Coordinator as soon as possible. The Graduate Program 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 professor, 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 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 graduate 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 Program Coordinator, The Major Advisor, The ACBS Program Graduate Committee Chair and lastly the Graduate College (Degree Counselor). All approvals are completed in GradPath. Once the Graduate Program 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) on all coursework taken for graduate credit and (b) on all coursework included specifically in his graduate program.” It should be understood that any student who fails to achieve a GPA of 3.0 for two consecutive semesters is in very serious academic trouble. 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 to 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 committee. After making any required corrections, the candidate submits two copies (one to the ACBS Graduate Program Coordinator and one to The Graduate Advisory Committee) on or before the date specified in the Graduate College’s Calendar for the candidates. (UA Graduate College Website>Policies and Procedures>Important Deadlines ***Non-Thesis MS Students follow the same deadlines as Thesis MS students.***)

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 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. In order to report the completion of a degree, the major advisor must first notify the ACBS Graduate Program Coordinator. The Graduate Program 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 mentor 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 mentor 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.” (Zelditch, 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 mentor 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 mentor be available from the very beginning. The mentor 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 mentor and role of the mentor 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 primary mentor, other individuals may play significant mentoring roles for the student. 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 mentor as advisor, supporter, tutor, master, sponsor and 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 mentor and the ACBS Program discussed above and 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 mentor is essential. The student should keep the mentor fully informed of his or her program status. It is important that the student tell the mentor as soon as problems arise. The student should be honest and open in sharing information. The mentor 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 mentors envision that their students will ultimately surpass them. Thus, good mentors 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 primary mentor. 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 primary mentor. There are perfectly good reasons for the entire program of study to be under a single mentor. However, when a change in mentors may seem appropriate, the student should discuss it with the primary mentor and those who might assume the role as the new mentor.

Formal Academic Experiences

Certain formal academic experiences fit well into the faculty-student mentoring relationship. Four are briefly discussed here as examples that mentor 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 students 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 director. 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 Program 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, we employ 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. Allow 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 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: GAT is responsible for syllabus and materials design, course planning, and grading, under supervision

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

Assistant Lecturer: GAT 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: GAT has little or no contact with students but is responsible for scoring or grading assignments submitted to primary professor.

Lab Assistant: GAT 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 GATs 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 3.00 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 work load 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”

Academic Eligibility

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 and 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 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 GATs 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 for 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. GATs 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 GATs not be allowed to engage in any commercial activity relative to the course with which they are assisting at this University (e.g., by selling course materials or conducting paid review sessions for courses in which they are directly involved as a GAT). **Assignment to Graduate Level Courses:** GATs may not be the instructor of record for classes giving graduate credit. Duties of GATs involved in graduate level classes should be restricted to non- subjective grading, lab setup, web site maintenance, and general advising.

Training: All GATs must complete training assignments before assuming direct instructional responsibilities at the University of Arizona. Any GAT 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 Assistant/Associate, Teaching," must complete the following two mandatory trainings prior to the beginning of employment:

Teaching Assistant/Associate Teaching 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 D2L. 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: <http://grad.arizona.edu/financial-resources/ta/tato>

English Proficiency

An international Graduate Assistant/Associate, Teaching, 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 <http://grad.arizona.edu/admissions/admissions-requirements/international-students/proficiency-in-english>

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 GATs' 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 GATs' performance and fitness for reappointment. GATs without a current evaluation on file are not eligible for rehire as a GAT. GATs receiving low evaluations are not eligible for rehire without prior Graduate College approval.

For any questions/concerns regarding GAT training, please contact Julie Treanor at jtreaenor@grad.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 GAT 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 GAT'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 GAT to the departmental secretary, 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 GAT.

GATs 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. GATs 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, GATs whose graduate GPA falls below a 3.00 are also not eligible for further appointments.

GAT 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, <http://grad.arizona.edu/financial-resources/ua-resources/employment/ga-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:

The screenshot shows the UAccess Student interface for GradPath. It features a blue header with the text "UAccess STUDENT". Below the header, there are several sections:

- GradPath**: A welcome message and instructions on how to proceed to GradPath forms, including a link to the "GradPath Forms" button.
- Graduate Degree Certification Forms**: A table with three rows: "GradPath Forms", "Graduate Petition", and "Leave of Absence Request".
- Information and Deadlines**: A table with two columns. The left column lists "GradPath Information", "Graduation Deadlines", "Links to Policies", "Registration Deadlines", and "Payment Dates & Deadlines". The right column lists corresponding links: "GradPath Information", "Graduation Deadlines", "Master's Policies", "Doctoral Policies", "Specialist Policies", "Certificate Policies", "Registration Dates", and "Payment Dates & Deadlines".
- Need Help?**: A table with two columns. The left column lists "Contact Degree Certification" and "GradPath Student FAQ". The right column lists "Contact Information for your Degree Auditor" and "GradPath FAQ".

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 screenshot shows the UAccess Student interface for GradPath forms. It features a blue header with the text "UAccess STUDENT". Below the header, there is a welcome message and an important note: "IMPORTANT: You do NOT need to re-do any forms in GradPath that you already completed on paper. GradPath does not contain any paper forms you have submitted, but they are on file with the Graduate College. Later forms are made available based on the steps you have already completed in GradPath or on paper. (Note that you must first submit the Responsible Conduct of Research form before other required forms will be available.)" Below this, there is a link to the degree counselor. The main content area is titled "MS - Animal Sciences (Active in Program)" and lists several forms with buttons for "VIEW CURRENT", "Create New", and "Modify". The forms listed are: "Responsible Conduct of Research Statement (ASCHS)", "Plan of Study (ASCHS)", "Master's/Specialist Committee Appointment Form (ASCHS)", and "Master's/Specialist Completion Confirmation (ASCHS)". Below this, there is a section for "Other Forms" with a "Transfer Credit Form" and buttons for "View Current", "CREATE NEW", and "Modify".

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

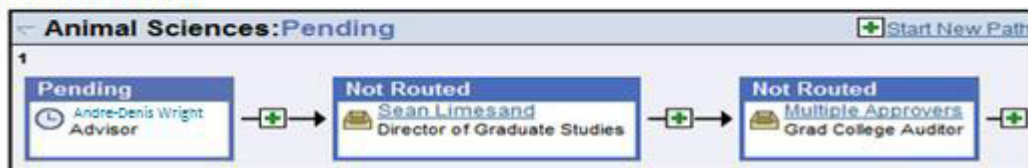
- Evaluation of Transfer Credit (If applicable)
- Master's/Specialist Plan of Study
- Master's/Specialist Committee Appointment Form--needs to be submitted by every Master's/Specialist student whether or not that student has a committee.
- Master's/Specialist Completion Confirmation Form—The Graduate 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 program 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:

Pre-check Stage



Approval for Major



The timeline that these need to be submitted by can be found at Graduate College Website by going to Policies and Procedures>Important 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 it should bring them to this landing page:

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)

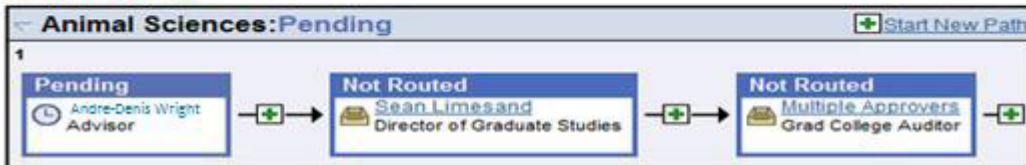
- Verification of Prospectus/Proposal Approval (submitted by Graduate Coordinator)
- Doctoral Dissertation Committee Appointment Form
- Announcement of Final Defense
- Results of Final Defense (submitted by committee chair)
- [The Submission Process](#)

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 program 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:

Pre-check Stage



Approval for Major



The timeline that these need to be submitted by can be found at Graduate College Website by going to Policies and Procedures>Important Deadlines.