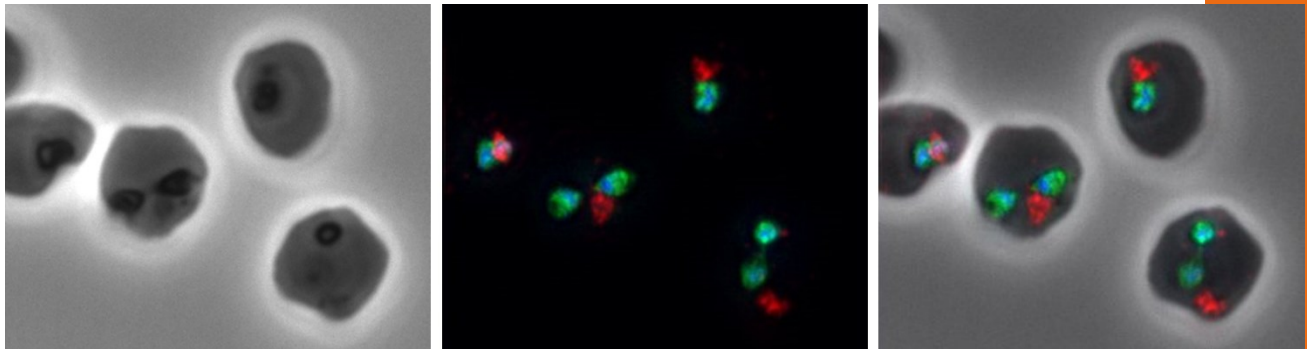


University of Florida
College of Veterinary Medicine
Department of Infectious Diseases
and Immunology

2021 - 2022 Guidelines for Graduate Study



These guidelines were developed by the Graduate Studies Committee of the Department of Infectious Diseases and Immunology, College of Veterinary Medicine, University of Florida, and were approved by the Graduate Faculty of this program. The purpose is to provide faculty and prospective graduate students with information on policies, procedures, and philosophies. They are not meant to be exhaustive. Additional information is available from the University of Florida College of Veterinary Medicine, Office of Research and Graduate Studies (<https://research.vetmed.ufl.edu/studies/>). The latest UF Graduate Handbook should be consulted for additional information.

**In any instances of disagreement arising over minimum requirements departmental programmatic requirements shall supersede those of the College of Veterinary Medicine and the UF Graduate Handbook
26 January 2022**

About the Department

Successful research and proper graduate training each takes a village. Our graduate students are encouraged to take full advantage of all expertise available. The *Department of Infectious Diseases and Immunology* is comprised of a diverse group of faculty and staff with expertise in a wide array of topics in medical bacteriology, virology, parasitology, and immunology. Departmental research emphasizes understanding host-pathogen interactions, immunity to infection, autoimmunity, pathogen detection, and development of vaccines and diagnostics, using technologies ranging from basic biochemistry to metagenomic and whole organismal approaches. Faculty research is supported by technical staff and postdoctoral research scientists. Graduate students in the department have historically been quite diverse, coming from various countries in Africa and Europe, China, Japan, Haiti, Egypt, and elsewhere, as well as the United States. Our students include those who are fresh from undergraduate or professional degrees, as well as those who have been in the workforce and desire to enhance their professional credentials.

Training Philosophy

The primary objective of graduate program in Infectious Diseases and Immunology is to train students in the ability to create new knowledge that is rigorously defined, reproducible, and which moves forward their area of research. This requires the cultivation of critical thinking skills, logic, and independent thought, alongside acquisition of relevant technical skills. These are all elements important to answering the significant questions being asked. At the same time, oral, written, and visual communication skills are honed. The overall goal is to produce graduates who will be invaluable investigators in academic, governmental, or industrial research positions, who can function independently and as part of collaborative teams.

Areas of study

The IDI graduate program encompasses fundamental to translational research opportunities in multiple aspects of bacterial, parasitic, and viral diseases, fundamental immunology, and in the pathobiology underlying these diseases. Topical areas of research include:

- Immunology and molecular biology of veterinary and human diseases of the tropics and subtropics, with an emphasis on hemoparasites
- Molecular aspects of viral infections, with emphasis on lentiviruses and Coronaviruses
- Microbe-host interactions at all levels from metabolic to cellular to organismal
- Diseases of pets, food animals, wildlife and exotic animals, and humans
- Molecular and biochemical analysis of the immune system
- Manipulation of host-microbe interactions for microbe control
- Development of vaccines and other antimicrobial approaches
- Development of diagnostics for rapid diagnosis and epidemiology
- Attention is now being paid to all aspects of the SARS-CoV-2 virus and COVID-19

Faculty and their general areas of interest

Moore, Julie, PhD; Professor and *Department Chair*. Malaria pathogenesis, with a focus on pregnancy
<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/julie-m-moore/>; “juliemoore at ufl.edu”

Allred, David R., MS, PhD; Professor and *Associate Chair for Curriculum and Graduate Studies*.
Biology of blood-borne parasites, with emphasis on *Babesia* and *Plasmodium*
<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/david-allred/>; “allredd at ufl.edu”

Brown, Daniel R., MS, PhD; Associate Professor and *Chair of Institutional Animal Care and Use Committee*. Cellular microbiology, with emphasis on *Mycoplasma* and related bacteria
<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/dan-brown/>; “drbrown at ufl.edu”

Brown, Mary B., PhD; Professor. Host-pathogen interactions in *Mycoplasma*, with emphasis on reproductive impacts
<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/mary-brown/>; “mbbrown at ufl.edu”

Crosby, Francy L., MS, PhD; Research Assistant Professor. Biology of tick-borne pathogens, including *Anaplasma* and *Ehrlichia*
<https://directory.ufhealth.org/crosby-francy>; “crosbyl at ufl.edu”

Curtiss, Roy, III, PhD; Professor. Genetic basis of bacterial pathogenesis and development of vaccines to prevent infections by bacterial, viral and parasite pathogens
<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/roy-curtiss-iii/>; “rcurtiss at ufl.edu”

Dinglasan, Rhoel D.R., MPH, MPhil, PhD; Professor and *Director of the CDC Southeastern Regional Center of Excellence in Vector Borne Diseases*. Transmission biology of vector-borne pathogens, with emphasis on malaria and arboviruses, such as dengue and Zika viruses
<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/rhoel-dinglasan/>; “rdinglasan at epi.ufl.edu”

Eshraghi, Aria, PhD; Assistant Professor. Mechanisms of host-bacterial interactions mediated by toxins
<https://directory.ufhealth.org/eshraghi-aria>; “ariaeshraghi at ufl.edu”

Jobin, Christian, PhD; Professor, and *Program co-Leader, Cancer Therapeutics and Host Response*. Intestinal microbiome in cancer development and drug responses
<https://gastro.liver.medicine.ufl.edu/about-us/meet-the-team/christian-jobin-ph-d/>; “christian.jobin at medicine.ufl.edu”

Maddaloni, Massimo. Adjunct Research Assistant Professor. Industrial microbiology and vaccine development
<https://directory.ufhealth.org/maddaloni-massimo>; “maddalonim at ufl.edu”

Mergia, Ayalew, PhD; Professor. Virus and host interactions to develop therapeutics and vaccines
<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/ayalew-mergia/>; “mergiaa at ufl.edu”

Nguyen, Cuong, PhD; Associate Professor. Immunology and autoimmunity, with special emphasis on Sjögren’s Disease

<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/cuong-nguyen/>; “nguyenc at ufl.edu”

Pascual, David, MS, PhD; Professor, and *Interim Associate Dean for Research and Graduate Studies*. Mucosal immunity, oral tolerance, vaccines, brucellosis, gonorrhea, botulism, HIV, SARS-CoV-2, Sjögren’s Syndrome, type 1 diabetes, rheumatoid arthritis, and multiple sclerosis

<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/david-w-pascual/>; “pascuald at ufl.edu”

Romero, Carlos, DVM, DipTMV, MSc, PhD; Research Professor. Molecular characterization of viruses from dolphins and whales

<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/carlos-romero/>; “romeroc at ufl.edu”

Sahay, Bikash, MVSc, PhD; Clinical Assistant Professor. Gut Microbiology, Immunology, CRISPR against viruses, and Lyme borreliosis

<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/bikash-sahay/>; “sahayb at ufl.edu”

Subramaniam, Kuttichantran, MS, PhD; Research Assistant Professor. Identification and phylogeny of emerging viruses in aquatic systems

<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/kuttichantran-subramaniam/>;

“kuttichantran at ufl.edu”

Tuanyok, Apichai, PhD; Assistant Professor. Molecular genetics of pathogenic bacteria, including drug-resistance; treatment and vaccine development for *Burkholderia pseudomallei* and *B. mallei*

<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/apichai-tuanyok/>; “tuanyok at ufl.edu”

Wang, Shifeng, PhD; Research Associate Professor. Development of vaccines against infectious diseases in humans and food animals, using live attenuated *Salmonella* vectors. Current work is focused on *Salmonella*, *Streptococcus pneumoniae*, *Mycobacterium tuberculosis*, influenza, *Clostridium perfringens* and *Eimeria*.

<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/shifeng-wang/>; “shifengwang at ufl.edu”

Yang, Xinghong, Ph.D.; Research Assistant Professor. Microbiology, immunology

<https://directory.ufhealth.org/yang-xinghong/>; “yangxh at ufl.edu”

Zhou, Liang, MD, PhD; Professor. Transcriptional and metabolic control of immune responses in mucosal tissues and host-microbiome interactions

<https://www.vetmed.ufl.edu/about-the-college/faculty-directory/liang-zhou/>; “liangzhou497 at ufl.edu”

General Facilities

Facilities housing members of the Department of Infectious Diseases and Immunology are primarily within the Veterinary Academic Building. The VAB is located on the main College of Veterinary Medicine campus, immediately adjacent to the Small Animal Hospital and Large Animal Hospital. Some faculty are located within the nearby Emerging Pathogens Institute on the main University of Florida campus, an easy half-mile away. All laboratories are modern and well-equipped with most equipment needed to support the individual faculty's research. The University of Florida also maintains the Interdisciplinary Center for Biotechnology Research (ICBR), a series of core laboratories offering specialized functions, such as electron microscopy, hybridoma production, next-generation sequencing, and protein analysis to name a few. The department maintains two BSL-3 laboratories within the VAB and has access to additional BSL-3 facilities elsewhere on campus, including for small animal experimentation. Animal Care Services provides animal facilities and care campus-wide, including specialized functions such as whole-animal irradiation and gnotobiotic mouse facilities.

Application to the IDI graduate program

The graduate program of the Department of Infectious Diseases and Immunology is an integral part of the graduate program of the College of Veterinary Medicine, leading to a Ph.D. or M.S. degree in Veterinary Medical Sciences (VMS). Application to the IDI graduate program is comprised of three steps:

A. Initiate the process:

- Prepare your *Curriculum vitae* ahead of time
- Tentatively identify a faculty member who is doing work of a nature you wish to pursue, and who might be appropriate to serve as your graduate studies supervisor. It is highly recommended that you contact that faculty member prior to application, in order to assess mutual interest and the possibility of joining that laboratory
- Make arrangements to have three letters of recommendation from individuals who know your potential for a research career sent directly to the college

B. Submit an application to the University of Florida

- Apply to the UF Graduate School for admission to the University of Florida, at <http://www.graduateschool.ufl.edu>
- Have your official transcripts from all college-level education you have received sent directly to the UF Office of Admissions (<https://admissions.ufl.edu/>)
- Have your TOEFL or IELTS scores sent directly to the UF Office of Admissions, if needed (<https://admissions.ufl.edu/>). TOEFL or IELTS is required of all international students
- The GRE exam is NOT required for either the Ph.D. or M.S. programs. As we will perform a holistic evaluation of your application, if you have taken the GRE and feel that your scores accurately represent your ability they may be included for consideration, but this is entirely optional

- Pursuant to Florida Statute, your application requires inclusion of all post-high school education and employment, as well as information about ongoing international affiliations and research funding. Please ensure this information is included on your curriculum vitae (CV) or résumé. (submit via CollegeNET, the online portal used by UF for admission applications)
- Pay the application fee (your application will not be processed unless you do)

C. Apply to the UF College of Veterinary Medicine

- Provide a copy of your UF Graduate School application to Ms. Sara Rubinstein (“s.rubinstein at ufl.edu”), Assistant to the Associate Dean for Research and Graduate Instruction
- Have at least three individuals who are familiar with your abilities write letters of recommendation on your behalf, to be sent to Ms. Rubinstein
- Indicate your reasons for wishing to pursue graduate study in Veterinary Medical Sciences
- Specify that you wish to enter into the Department of Infectious Diseases and Immunology
- Indicate the semester during which you wish to begin your graduate training. Plan well ahead, as the review and admissions processes take time. Students are typically expected to begin during the Fall semester for reasons of course availability, but this is not absolute
- Indicate your specific areas of interest and your long-term goals
- Indicate the specific faculty member(s) whose laboratory you feel most closely aligns with your interests
- Provide a brief overview of your credentials
- Ms. Rubinstein will forward your completed application to the departmental Graduate Coordinator, Dr. David Allred (“allredd at ufl.edu”), who will arrange for departmental review
- Decisions regarding admissions will be made by the departmental Admissions Committee in consultation with the specified Mentor, Dr. Allred, and Dr. Moore
- Ms. Rubinstein will inform you of the decision on your application. If successful, Ms. Rubinstein will provide a letter of acceptance in which any stipulations or restrictions are enumerated. These include both general requirements and any that are applicant-specific
- Once these stipulations are accepted by the applicant, Ms. Rubinstein will request the applicant’s admission from the UF Graduate School

D. Other graduate programs in which IDI faculty participate

Many IDI faculty participate in graduate programs outside of the College of Veterinary Medicine and sometimes recruit students through those programs. Individual laboratories may have an interactive mix of students from more than one program. The most common other programs include (a non-exhaustive listing):

- **Animal Molecular and Cellular Biology (AMCB); multi-departmental, university-wide**
- <https://programs.ifas.ufl.edu/animal-molecular-and-cellular-biology/>

- **Biomedical Sciences (BMS); College of Medicine**
- <https://biomed.med.ufl.edu/>
- **Environmental & Global Health (EGH); College of Public Health & Health Professions**
- <https://egh.php.ufl.edu/>
- **Wildlife, Ecology, and Conservation (WEC); College of Liberal Arts and Sciences**
- <https://wec.ifas.ufl.edu/>
- **Genetics Institute (UFGI); multi-departmental, university-wide**
- <http://gradprogram.ufgi.ufl.edu/>

Deadlines

- Under normal circumstances, applications are accepted for entrance during the Fall semester, with an annual application deadline of 01 July. To ensure consideration for fellowship support, applicants should apply by 01 January of that year
- *In extenuating circumstances only*, applications may be considered to begin graduate school during the Summer C semester or Spring semesters, with application deadlines of 01 March and 01 November, respectively
- **International applicants**, please submit completed applications at least 30 days ahead of posted deadlines to ensure timely processing of your application

Admission Criteria

A holistic approach is taken when reviewing applicants. Everyone has strengths and weaknesses, and shortcomings sometimes show up in specific academic metrics. We want to look beyond those to identify the individual's true potential and their fit with our graduate program, mentor, and ongoing research. International applicants should look at information found at <https://admissions.ufl.edu/apply/international/> as well.

Grade point average: No rigid cutoff is made. However, it is anticipated that successful applicants will typically have an undergraduate GPA of 3.2 (on a 4-point scale, or equivalent on alternate scale) or above. Special attention will be focused on your upper division science and math courses

GRE scores: As stated, GRE scores are not required. At the applicant's discretion, GRE scores may be included as a part of their application if they feel their scores are an accurate reflection of their abilities and would increase their chance of acceptance

Tests of English as a second language (only one of the below is required):

- IELTS (The International English Language Testing System) score of 6.0 or greater

- TOEFL (Test of English as a foreign language)
 - internet-based: 80 or greater
 - paper-based: 550 or greater
- Verbal GRE score of 140 or better, *if student includes GRE scores*. This is in addition to a satisfactory IELTS or TOEFL score

Identification of a faculty mentor interested in training the applicant: Key to admission is the identification of a faculty mentor who is interested in taking on a new graduate student. This is important, as this will typically require that the mentor identify funding for research expenses to support the student's project, and for the student's tuition and stipend. It is also essential for success that the student and potential mentor share overlapping research interests

Conditional admission: An applicant who fails to meet all the above admission requirements, but is deemed to have significant potential for success as a graduate student, may be admitted conditionally. Applicants admitted conditionally must meet additional criteria:

- A conditionally admitted student must attain regular graduate student status by maintaining at least a 3.0 GPA during the first year of graduate studies and by satisfying any additional requirements set forth at the time of admission (may be unique to the applicant)
- The program of a conditionally admitted student will be reviewed each semester by the Graduate Coordinator
- Assuming the above conditions are met, the student will attain regular graduate student status at the end of the first year of study. *A conditionally admitted student who fails to meet the above conditions will be terminated from the graduate program.*

Financial Support

Financial aid for the first year of study, available in the form of stipends or assistantships, will be provided on a competitive basis for well-qualified applicants. As a rule, support of students by their faculty mentors will be expected in the second and subsequent years. Students are expected to write a fellowship application (e.g., an F31-type NIH proposal) during their second year of study to help extend program support to additional students. Note that while identification of funding is primarily a faculty obligation, it is always helpful if an applicant can provide proof of support (typically a government-sponsored traineeship). We do not typically anticipate a need for self-support by students in the Ph.D. or thesis M.S. programs. However, students capable of self-funding, perhaps through an institutional or governmental source, will receive full consideration.

Cost of Living

North-central Florida is one of the more reasonably priced areas of the United States in which to live, for most necessities. The presence of a major research university guarantees that Gainesville has abundant off-campus housing surrounding the campus. Much of the surrounding housing is

student-oriented, and that is where most graduate students live. Limited, very affordable on-campus dormitory housing is available for single students and for married students with families. However, there may be a waiting list for on-campus housing. Additional information may be obtained from the University of Florida Division of Housing (<https://www.housing.ufl.edu/>) and City of Gainesville (<http://www.cityofgainesville.org/>) websites, and commercial services such as Apartment Hunters (<https://www.apartmenthunters.com/>).

Transportation

Students employ a variety of means to get to campus. Some live close enough to walk or ride a bicycle. Gainesville has a well-developed public transit system, the Regional Transportation System (RTS; <http://go-rtts.com/>), servicing most areas of town and outlying areas. Students ride for free, simply by showing their GatorOne student identification card. Others who own an automobile may drive. The cost of an annual student parking pass is \$160 as of April 2021.

Requirements for Successful completion of the IDI Ph.D. program

- Student and Supervisor will jointly define a course of training, documented in a formal *Individual Development Program (IDP)*, outlining commitments by both student and Supervisor
- *Ph.D. Supervisory Committee*: this committee should be appointed as soon as possible, but not later than the end of the student's second semester. Members should be mutually agreed upon by the student and mentor. The committee will be comprised of a minimum of five members, four of which must be U.F. Graduate faculty. Members should be chosen based upon their areas of expertise and ability to assist the student in the successful, rigorous completion, analysis, and communication of their project. Additional functions include the identification of any training deficiencies and necessary coursework, administration of the student's qualifying examinations, and evaluation of the final dissertation. A minimum of two of the members must be from outside of the College of Veterinary Medicine, one of whom will serve as an external member (required). When appropriate, a member may be from another institution. In such case, that member must be nominated and accepted for Special Member status. The committee must be approved by the department Chair or Graduate Coordinator, the Associate Dean for Research and Graduate Studies, and the Dean of the Graduate School
- *At least 90 credit hours total is required*, with a combined maximum of 30 credit hours transferable from an accredited M.S., D.V.M., or other post-graduate program. At least 60 credit hours must be in letter-graded courses, and students must maintain a GPA ≥ 3.0 . Failure to maintain a ≥ 3.0 GPA at all times will result in academic probation or dismissal

- *Uniform course requirements:* IDI Ph.D. students are expected to complete at least one course in each of these disciplines, selected from the list below. When used to fulfill the discipline requirement, the alternative courses (indented, italicized listings) and any courses not listed here require prior approval from the student's advisory committee, Graduate Coordinator, and Associate Dean for Research and Graduate Studies. More information on all these courses may be found at <https://one.uf.edu/soc/>

- **Biochemistry/ Molecular Biology: 3 credits**
 - BCH 5413 Mammalian Molecular Biology and Genetics (Fall)
 - BCH 6415 Advanced Molecular and Cell Biology (Spring)
 - GMS6038 Bacterial Genetics and Physiology (Fall)
 - *GMS6040 Host Pathogen Interactions (Fall)*
 - *BCH6206 Advanced Metabolism (Fall)*

- **Immunology: 3 credits***
 - GMS 6140 Principles of Immunology (Spring)
 - PCB5235 Immunology (Spring)
 - *VME6140 Mucosal Immunology (Spring)*

- **Statistics: 3 credits**
 - STA6166 Statistical Methods in Research I (Fall, Spring)
 - PHC6050C Biostatistical Methods I (Fall)
 - *STA6167 Statistical Methods in Research II (Fall, Spring)*
 - *PHC6051 Biostatistical Methods II (Spring)*
 - *PHC6088 Statistical Analysis of Genetic Data (Spring)*

- **Research Ethics: 1 credit**
 - VME 6767 Issues in the Responsible Conduct of Research (Fall)
 - EAB6780 Ethics and Professional Issues (Fall)
 - GMS7877 Responsible Conduct of Biomedical Research (Spring)

- **Seminar: 6 credit hours or more as a course**
 - VME 6933 Seminars in Infectious Diseases and Experimental Pathology (Fall, Spring)
 - VME 6934 Graduate Journal Club- Mechanisms of Microbial Virulence (Fall)
 - VME 6937 Graduate Seminar Series (Spring)
 - Students are expected to participate in graduate seminars and to attend all departmental seminars.
 - Seminars may be substituted with Journal Club courses or seminar courses offered by other departments, upon approval.

- **Grant writing: 1 credit**
 - GMS6096 Introduction to NIH Grant Writing for Biomedical Sciences (Spring)
 - VME6934 Rules of Engagement: Unique Challenges of F and K Grant Applications (Summer)

- GMS5905 Grant writing courses with various foci
 - Infectious diseases (contact R. Dinglasan)
 - Molecular Cell Biology (contact S. Huang)
 - Biochemistry (contact L. Bloom)
 - Pharmacology (Contact A. Liu)
- PHC7727 Grant Writing Skills for Clinical and Health Research
- Clinical and Translational Sciences Institute K college
 - <https://www.ctsi.ufl.edu/education/medical-fellows/k-college/>
- **Doctoral research credits:**
 - VME 7979 Advanced Research: taken prior to achieving candidacy
 - VME 7980 Doctoral Research: taken subsequent to having achieved candidacy

***Immunology** is a requirement unique to the IDI sub-program within VMS; all others are also VMS-wide requirements.
- *Additional, specialized coursework* is likely to be required, based upon recommendations from the student's mentor and supervisory committee, special requirements of the individual's project, and to address any specific areas of perceived weakness in the student's background
- *Definition of the student's research project:* In consultation with the mentor, the Ph.D. student is expected to identify a general research problem. Through intensive investigation of the published literature the student will identify a specific outstanding problem in that area to address. The student will prepare an NIH- or USDA-style research proposal addressing the problem (following up-to-date agency guidelines). This proposal will form at least a part of the written qualifying examination, with additional obligations being at the discretion of the student's supervisory committee
- *Qualifying examinations:* The student must pass both written and oral examinations demonstrating sufficient knowledge in the subject area, as well as the ability to think and communicate at the Ph.D. level about the general area in which student is studying. Qualifying exams should be completed by the end of the second year whenever possible, and must be completed prior to the end of the seventh semester (including summers) of enrollment. As mentioned above, the written exam will be comprised at least in part of the preparation of a research proposal in the form of an extramural proposal to the NIH, USDA, FDA, or other major agency as appropriate to the student's field of study. The student's exam is open to all departmental graduate faculty to attend and ask questions. However, only members of the student's supervisory committee may vote on admission to candidacy

- *Conduct of the Ph.D. research project:* The student will be responsible for the conduct of an intensive, investigative research project. While the nature of the project may take a wide variety of forms based upon the identified research question(s) being addressed, it should result in a minimum of one- and preferably two or more- first-author peer-reviewed publication of high intellectual merit. The student is advised to take advantage of the insight and expertise of not only their mentor, but the members of their supervisory committee and other scientists. Good science is not done in a vacuum
- *Successful defense of the Ph.D. dissertation:* The defense is comprised of an oral presentation that is open to the public, followed by a final examination administered by the student's supervisory committee. All U.F. graduate faculty may participate in the final examination, but only members of the student's supervisory committee may vote

Requirements for Successful completion of the IDI M.S. program

- *At least 30 credit hours total is required.* At least 12 of the required 30 credits must be in letter-graded courses in the student's major (for example, VME courses). Up to 9 credit hours may be transferred from an accredited post-graduate institution, upon recommendation by the student's mentor, supervisory committee, and the Associate Dean for Research and Graduate Studies, and approval by the Dean of the Graduate School
- *A supervisory committee must be assembled,* similar to that formed for Ph.D. students. In consultation with the student's mentor, a committee of *at least three* UF graduate faculty should be formed as soon as possible. It is recommended that this be accomplished no later than the end of the first semester, and must be no later than the end of the second semester of registration. Members shall include the student's research supervisor and at least one member from outside the College of Veterinary Medicine. One function of the committee is to help identify needed coursework. Thus, there is value in forming the committee as early as possible. Additionally, a function of the committee is to help guide and evaluate the student's research project and thesis. The student must meet with the supervisory committee annually at a minimum, although more frequent meetings are generally advisable. The committee must be approved by the department Chair or Graduate Coordinator, the Associate Dean for Research and Graduate Studies, and the Dean of the Graduate School
- *Uniform course requirements:* There are fewer specific course requirements for the M.S. degree than for the Ph.D. However, the course offerings listed for the Ph.D. degree also hold here, with the same approval requirements. Required discipline areas include:
 - **Biochemistry/ Molecular Biology: 3 credits**
 - **Statistics: 3 credits**

- **Seminar: a minimum of 1 credit as a course.** Students are expected to participate in graduate seminars and to attend departmental seminars. Seminars may be substituted with Journal Club courses upon approval, as described for the Ph.D. program
- *Additional, specialized coursework* may be required, determined in consultation with the student's supervisory committee. Such course requirements are based upon the individual's project and perceived areas of weakness
- *Masters research credits:*
 - VME 6971 Research for Masters Thesis: a maximum of 6 credits may be counted toward the 30 credit minimum, although more may be taken. Three of the 6 credits must be taken during the student's final semester of enrollment
- *Students must maintain a GPA ≥ 3.0 .* Failure to maintain a ≥ 3.0 GPA at all times will result in academic probation or dismissal

Successful defense of the M.S. thesis and oral examination: the student's mentor, supervisory committee, and the Graduate School must all approve the thesis. The student must also pass an oral examination that is administered following the student's presentation of the thesis project outcomes