Guidelines for the Graduate Program
in Animal Biology

2017-2018
Overview:

The Department of Animal Biology offers graduate work leading to the Doctor of Philosophy degree (PhD) and Masters (MS) degree in Biology. Due to the breadth of modern biological research, students are expected to become proficient in three of six areas:

1. Ecology
2. Evolution
3. Behavior
4. Genetics/Genomics
5. Physiology & Morphology
6. Conservation

Within the first three months of entering the graduate program, the student and his/her advisor will meet to discuss which three areas are most appropriate for that student. The student is expected to complete advanced coursework in those three areas. Additional courses are chosen by the student in consultation with the student’s advisor and advisory committee. The number and nature of these courses will vary with the research interest and background of the individual. Previous graduate-level coursework can be applied. Although there are no required courses, students are expected to take whatever courses are deemed necessary for the successful completion of oral and written examinations.

All graduate students are required to hold an annual committee meeting. Failure to complete this requirement can result in denial of future teaching or research appointments. Students need to submit any written material (thesis proposal, thesis, etc.) to their committee members at least one week prior to a scheduled meeting, unless other arrangements have been made with an individual committee member.

Students are encouraged to begin research as soon as possible.

Student progress will be monitored in a variety of ways. All students in the program will receive a graduate student handbook outlining the expectations via e-mail. Included in the handbook will be information concerning the requirements for coursework, written and oral exams, proposal defense, teaching requirement, and final defense. In addition, students must fill out an Annual Survey each Spring. This annual survey is mandated by the Graduate College and consists of: (1) A student self-report and assessment of academic progress; (2) A statement prepared by the adviser and at least one other faculty member that assesses student progress, strengths and weaknesses; (3) An opportunity for the student to discuss this review in person. One faculty meeting each year will be devoted to monitoring the progress of all students in the program. Students failing to make adequate progress (not taking exams, not conducting research, low GPA, no committee, etc.) may be dismissed from the program.

PhD Students
Preliminary Exam. - Following completion of coursework, students will take a preliminary examination to be completed no later than the fifth semester of study. If students fail to meet this deadline, they will be on academic probation. The examination will consist of both written and
oral questions and will test the student's general knowledge in the three areas they have declared as being most relevant to their research (see list of topics) as well as their preparation for thesis research. The written portion of the examination is to be completed within a one-week period and will cover general knowledge. The format is to be determined by the graduate committee, but students are encouraged to devote one day each to the questions proposed by each committee member. During the examination, the student can use whatever literature is necessary to address the question, unless committee members wish to assess general background knowledge without students having access to the literature. Following the written exam, the student will meet with each committee member to discuss the strengths and weaknesses revealed by the written exam. Within two weeks of the written exam, the student will complete an oral exam. The oral exam will pertain to their responses to the previous written questions and questions about general knowledge in the student’s three areas. Examples of common prelim questions are listed below.

Proposal Defense. - Students must submit and defend a thesis proposal no later than the end of their 3rd year. The general format of the proposal is listed below. The purpose of the thesis proposal defense is twofold. First, the proposal should provide the thesis committee with enough information to determine whether or not successful completion of the proposed research would be sufficient for a PhD in Animal Biology. Second, the proposal should be written in such a way that it demonstrates that the student is proficient in scientific writing. A passing grade qualifies the student as a PhD candidate. The proposal defense will be approximately one and a half to two hours.

Recommended Proposal Format
The below is the guideline for Ph.D. proposals. Students may use a different format provided that this has been approved by the advisor and advisory committee. Note that a Ph.D. thesis is expected to have a minimum of 3 original data/theory chapters.

Up to 8 pages single-spaced, 12 point font, 1 inch margins. References and Figures not included
1. Introduction of broad area of interest (knowledge gaps) leading into aims/objectives 1-2 pgs - This section is intended to explain to your committee the basic biology and theory grounding your proposal and the areas your work will address.
2. Study system
3. A series of aims and objectives. For each aim and objective:
   - Introduction to specific aim - 1-2 paragraphs
   - Hypothesis
   - Data to be collected
   - Preliminary results (if applicable)
   - Methodology and Analysis- Broken down by aims detailing how you will accomplish the aims as detailed above
   - Expected Results
4. Synthesis and Significance of Proposed Work
   - Students should write a paragraph or two of how these chapters will address knowledge gaps and the overall significance of the work.
5. Timeline for completion- short but detailed tables are encouraged.
6. References – This must have uniform format of your choosing.
Advisory Committee Requirements. - By policy of the Graduate College, the dissertation committee must be composed of at least four voting members, at least three of whom must be members of the Graduate Faculty; at least two members must be tenured. The student’s advisor is also a member of the dissertation committee. Students should assemble committees based on the three areas in which they have chosen to specialize. At least two members of the committee must be faculty members in Animal Biology, and at least one member must hold an appointment in a department other than Animal Biology. Students are strongly encouraged to form their committee by the end of their 1st year. Students must have a committee meeting by the 1st semester of their 2nd year.

Teaching Requirements. - Ph.D. students are required to serve as teaching assistants in undergraduate courses for at least two semesters. If a student has 5+ years of funding from sources other than teaching assistantships (e.g. RA or Fellowship), they can petition the Graduate Admissions Committee to waive this requirement.

Thesis Defense. - Finally, students must present a public seminar summarizing the results of their dissertation research. A thesis based on original work demonstrating a thorough knowledge of theory and techniques must be defended at the final examination. A successful dissertation will be sufficient in quantity and quality of the original research performed and be written in such a way as to suggest a strong likelihood of publication in scientific journals. Prior to setting the date of the thesis defense, Ph.D. students are required to have submitted, with approval of their advisor and/or committee, at least one chapter of their dissertation for publication. Students should aim to complete their PhD in five years.

MS Students

Course Work Requirements. - By the end of the second year, students must complete 32 hours of course work in their three core areas with grades no lower than B or S. Twelve credits of 500-level are required. No more than 12 hours of research can be counted.

In addition to course work, graduate requirements include completion of a thesis (599) that is defended. Student research will be guided and approved by an Advisory Committee of three faculty, including the Major Advisor who will serve as chair. Membership of the Advisory Committee must be approved by the Director of Graduate Studies for Animal Biology. At least one member of the Advisory Committee must be a faculty member within Animal Biology.

Beyond these requirements, the particular courses recommended by the advisor will depend on the individual student's previous training, experience, and knowledge of the subject matter. All students will be required to develop strong quantitative skills, which may require advanced course work in statistics or other analytical methods.

Each student is expected to make satisfactory progress towards the M.S. degree. Satisfactory progress is defined as meeting all degree requirements, including satisfactory grades in coursework, participation in seminars, performance in teaching and research, and passing examinations on or before their scheduled dates. A finding of unsatisfactory progress can be made at any time during the student's participation in the program and will be reported by the Graduate Committee to the student, the major advisor, and the director and result in the student
being placed upon probation. A second finding of unsatisfactory progress will be cause for
dismissal from the program. Masters students are typically expected to complete their degree
within two years, depending upon their prior experience. One (or more) high-quality data chapter
is considered sufficient for a M.S. degree.

Transitioning from a M.S. to a Ph.D.

Occasionally, students are enrolled in the M.S. program and subsequently decide that they would
like to pursue a Ph.D. This can be accomplished through one of two different mechanisms
requiring either reapplying to the graduate program as a Ph.D. student or petitioning and getting
approval from the Graduate Admissions Committee.

Mechanism #1: After completing their M.S., the student can reapply for the Ph.D. program. The
student is considered for admission along with other new applicants. If accepted to the Ph.D.
program, they are guaranteed five years of funding (as if they were entering the program anew). The data submitted as a part of the M.S. thesis may not be used for the Ph.D.

Mechanism #2: A currently enrolled M.S. student in good standing may petition to be
reclassified as a Ph.D. student. In this scenario, the student does not necessarily complete a M.S.
but petitions to transition to the Ph.D. program. As with all Ph.D. students, the student is
guaranteed five years of funding, but the years already spent in the program count towards that
total. For example, a M.S. student who has been in AB for 2 years and is reclassified as a Ph.D.
student will be guaranteed 3 years additional funding. Here, the data collected during the first
two years may be used for the Ph.D.

Sample Exam Questions:

The next several pages contain examples of the types of questions that students will be asked
during written and oral exams. Students are expected to be proficient in three of the six areas.
Students should keep in mind that the questions listed below are only examples and exams will
not necessarily be limited to the questions listed here (nor will students be expected to know all
of these topics). Also, students should keep in mind that there is often overlap between the areas
and are advised to read though all sections for relevant questions.

Students are required to meet with all committee members prior to their exams to discuss
expectations. The last page of this section contains a form that you should take to your meeting
with each committee member. Please bring the signed form with you to the prelim.
Ecology
Books:
Ricklefs, R.E. 2006. Economy of Nature (5th ed.)

People:
What are/were the major contributions of the following people:
Hutchinson, S.P. Hubbell, R.L. Lindeman, R.M. May, R.H. McArthur, E.P. Odum, R.T. Paine,
D. Simberloff, E.O. Wilson

Questions:
What is a population?  What are the “vital rates” of that population?  Explain the major factors
influencing these rates and how those influences might change over space or time. Are
populations regulated?

Discuss the historical development of current thinking about the importance of density
dependence (on populations, life histories, etc.).

What is a life-table?  What is a Leslie Matrix?

What is future reproduction?  How is it measured?

Give the formula for r, R, and reproductive value at a given age class.

How and why do densities within populations fluctuate?

What is a niche?  Trace the history of this concept.  Are niches easy to define in nature?  Explain.

What are metapopulations?

What are the differences between stochastic and deterministic processes?

What is a community?  How do you tell if organisms are really interacting?

Discuss determinants of species richness within a community.

What are the primary ways in which species interact?  Give examples of each. How important is
each in determining local or regional community structure?

Explain the Lotka-Volterra models.  Be able to drawn them on the board an answer questions
regarding different possible scenarios.  Are these models still useful?

Describe functional response curves.  Which type is most likely for your study organism?

What is the paradox of enrichment?
What is the Theory of Island Biogeography? Trace the history of this concept.

What are the possible mechanisms underlying the species-area effect?

What are the major models proposed for species co-existence or competition and how do they vary? Which of these are equilibrium and which are non-equilibrium explanations? Which type of explanation (equilibrium or nonequilibrium) is most applicable to natural systems?

Explain Tilman’s $R^*$. How is this concept used to explain interspecific interactions?

What are assembly rules? Do they really exist?

Why is scale important in ecology?

What are metacommunities?

Are trophic levels a useful concept in community ecology? How are trophic levels determined? What are some hypotheses for the factors which determine food chain length?

What is a life-history? Why do life-histories vary in nature?

What is Cole’s paradox? What is its resolution?

What is bet-hedging?

What is an ecosystem? How does energy flow through an ecosystem? What factors regulate primary productivity?

What is the trophic-dynamic concept? Who developed it and how has it been applied?

What makes some species so invasive? Why are some communities more or less resistant to invasion?

How do spatial and/or temporal variation influence population and community-level processes?

What is the relationship between ecosystem productivity and species diversity?

Describe the debate between Clements and Gleason. What have we learned since then?

Does Ecology have any universal theories or laws? If so, please describe. If not, why?
Evolution

Books:

People:
What are/were the major contributions of the following people:

Questions:
Define evolution. What are the necessary conditions for evolution? Define natural selection.

Can you have evolution without natural selection? Can you have natural selection without evolution?

Define fitness. How can fitness be measured? Give three different ways to measure fitness.

Define adaptation. How do comparative studies test for adaptation? How do scientists test whether a trait is adaptive within a population? Are these two methods at odds? In other words, are there scenarios when one method would infer adaptation when another would not?

In evolutionary biology, what is meant by the term “constraint”. In your opinion, how important are constraints in evolution? How would you go about identifying a constraint?

Define these types of selection: directional, stabilizing, disruptive, frequency-dependent, heterozygote advantage, underdominance, sexual; describe the effects on genetic variation

Define effective population size. What determines effective population size?

What processes maintain genetic variation? What processes erode genetic variation?

What’s the difference between heritability and genetic variation?

Describe three ways to measure heritability.

Define additive, dominance, epistatic variance, environmental variance, and maternal effects.

What are genetic and environmental correlations and how do you measure them?

Differentiate between mutational and standing genetic variation.
Do fitness components have high or low genetic variation? Cite 3 papers to defend your answer.

What are antagonistic pleiotropy and sexual antagonism? Can these processes maintain genetic variation? Cite 3 papers to defend your answer.

What is the difference between phenotypic plasticity, GxE interaction, and reaction norm? What is the difference between phenotypic plasticity and canalization?

Define inbreeding, identity by descent, genetic drift, bottleneck, heterozygosity, polymorphism, F statistics, genetic distance, genetic load, linkage disequilibrium, hitchhiking.

Define kin selection, sexual selection, ESS, game theory.

Describe three theories for the evolution and maintenance of sex (recombination); what is supporting or contradictory evidence?

Describe two theories for the evolution of senescence.

What effect do the following processes have on H-W equilibrium: selection, drift, inbreeding, assortative mating, mutation, migration

Describe the Modern Synthesis, the Neutral Theory of Molecular Evolution, the Nearly Neutral Theory, Shifting Balance, Punctuated Equilibrium

Define allopatric, sympatric, parapatric speciation, prezygotic and postzygotic isolation, reinforcement, founder effect, cladistics, phenetics, homoplasy, synapomorphy, autapomorphy, ancestral, derived, convergent evolution.

Why is gene flow a problem for population divergence and speciation? Why types of speciation are most common? What evidence can you cite to support your view?

What is meant by “Evo-Devo”? Why is it important?

What is the basic idea of Wright’s Shifting Balance Theory? Is there good evidence for it?

What are the essentials of Eldridge’s and Gould’s theory of Punctuated Equilibrium?

Be able to give a brief description of the history of life, including times of appearance of major groups of organisms. Approximately how long ago are the first records of organisms?

What do the ant and the peacock symbolize about problems Darwin had resolving? What are contemporary views on these issues?

How are phylogenetic trees constructed and what is the logic behind them? In other words, what is the logic behind parsimony?
**Genetics**

**Books:**

**People:**

**Questions:**
Define pleiotropy, epistasis, co-dominance, incomplete dominance, penetrance, expressivity, euploidy, polyploidy. Give an example of a trait that is affected by each.

What do the following terms mean: haploid, diploid, aneuploid, trisomy, deletion, duplication?

What are linkage, recombination, and map distance, and how are they related?

What are temperature-sensitive mutations?

What is a complementation test?

What is the Central Dogma of molecular genetics?

What are promoters, enhancers, transcription factors?

What is codon bias?

Define imprinting, X inactivation, Lyon Hypothesis, genetic anticipation, hybrid dysgenesis

What are chromosomal inversions, translocations, deletions, and duplications, and what effects do they have on the organisms that carry them?

What are: transposable elements, retrotransposons, psedogenes, introns, exons

How do transposons and retrotransposons insert themselves in the genome?

Who showed that DNA was the hereditary material, how, and when?

Who showed that DNA replication was semi-conservative, how, and when?

Who showed that mutations are random with respect to their selective advantage, and how?

Who invented PCR, and when?
Describe the early developmental genetics of *Drosophila*; include maternal effect genes, segmentation genes, gap genes, pair-rule genes, segment-polarity genes, homeotic genes.

Define imaginal disks, fate maps, blastoderm, homeodomain, homeobox.

Define genetic mosaic, chimera, contig, ESTs, cDNA, RFLPs, RAPDs, VNTR, DNA fingerprint, minisatellite, microsatellite, SNP, PCR, rt-PCR, RNAi, RNAseq, microarray, enhancer traps, reporter gene, P elements, GFP, genome, transcriptome.

What are “master-control genes”?

How are Hox genes distinct from other master-control genes?

What is a cis acting element? What is a trans acting element?

Describe transcription. What enzymes are involved? How do they know where to go?

Described how genes are copied in mitosis. How does mitosis differ from meiosis?

How are genes translated?

For your favorite organism, how much DNA is noncoding? Is this DNA “junk” DNA or does it have a purpose? How might one tell the extent to which noncoding DNA has function?

What determines the differences in genome sizes across various taxa? For example, why do frogs have such large genomes and fugu have such small genomes?

What is the significance of genome duplication? How might genome duplication be important in effecting genetic variation?

What are inversions? What is their significance?

Why are inversions said to suppress crossing-over?

What is the importance of mutations? How are they generated?

What other genetic mechanisms (besides mutations) might generate genetic variation?

The term "genetics" has many uses. Some people focus on determining the "genes for a trait" - meaning that they want to known which genes are involved in the pathway controlling the development of a particular trait. Other people focus on the standing genetic variation in a trait within a population and want to understand how genetic variation effects contemporary evolution (i.e. the nature of the response to selection, genetic drift, etc.). What type of genetics do you study? Are there any insights to be gained from the other vantage point?
Behavior
Books:

People:

Questions:
What are the major theories for the evolution of social behavior?

What is parental care (or investment)? What determines how much or little care an individual will expend? What determines which sex gives care?

What is the lek paradox? Has it been resolved?

How common is polyandry? Why?

Animal behavior can be explained in terms of both proximate and ultimate causes. Explain the difference between proximate and ultimate causes. Are there conditions under which understanding one type of cause illuminates the other type?

Give an example of animal behavior that is affected by pleiotropy. Give an example of animal behavior that is affected by epistasis.

What are the relative merits of the comparative method and the experimental approach for studying the adaptive significance of behavior?

Optimal foraging theory focuses on the questions of how animals should most efficiently search for food. Models have focused on two questions: (1) which prey items should animals choose and (2) how long should animals stay in a given patch? Explain the common assumptions made in these types of models and describe a series of experiments to test them.

Define “ideal free distribution” and “optimal foraging”. Are these two terms different?

Why are warning colors conspicuous? Why is the evolution of aposematic coloration problematic? What solutions have been proposed to this problem?

What are the costs and benefits of communal living? What determines group size? Are group sizes optimal in nature? How would you design an experiment to test whether group size is optimal?
Define the operational sex ratio (OSR). To what extent does the OSR explain the strength of sexual selection? What are the common criticisms of the OSR?

Explain the difference between quantitative genetic models, dynamic state variable models, and ESS models for animal behavior. What are the critical assumptions of each?

Define sperm competition. To what extent does sperm competition actually involve competition between males versus female choice of various sperm types? Describe 3 research articles that bring data to address this issue.

How does sperm competition differ between external and internal fertilizers?

What are the necessary conditions for reliable, honest signaling? In your opinion, are signals generally honest? What evidence can you site to support your opinion?

Does signal “honesty” differ between signals used in competition between males versus signals used between males and females?

How does the evolution of traits used in male/male competition for mates differ from the types of signals used by females for mate choice?

Explain the difference between the following hypotheses for the evolution of female mating preferences: Fisher’s Runaway, Direct Benefits, Good-genes, Sensory Bias, Sexual Conflict. What are the critical assumptions of each model?

Under what conditions should animals involve multiple signals?

Does sexual selection affect speciation? If so, under what conditions? Cite at least 3 papers to support your view.

Does the field of animal behavior assume that populations are at an equilibrium or at a non-equilibrium? What are the ramifications of this on comparative studies? On studies of frequency-dependence? On experimental studies of optimal animal behavior?

What are Tinbergen's Four Questions?

What is learning? Explain the difference between associative and non-associative learning.

Discuss the history of the nature-nurture debate.
Physiology

Books:

People:
What are/were the major contributions of: A. Krogh, C. Ladd Prosser, K. Schmidt-Nielsen

Questions:
Acquiring energy from food involves (1) ingestion, (2) sequential breakdown of the food, (3) absorption of food materials, and (4) the elimination of waste. Describe FULLY where and how these processes occur in your favorite organism.

What properties of proteins (as opposed to the other macromolecules: nucleic acids, lipids or carbohydrates) makes them so suitable as biochemical operators in cells (i.e. as molecular pumps, enzymes, channels, receptors)?

How do hormones and neurotransmitters differ? How do endocrine and neuroendocrine cells differ? Provide several examples of hormones, neurotransmitters, endocrine cells and neuroendocrine cells (where, what and how).

Define homeostasis in a physiological context. What is negative feedback? What is positive feedback? Use specific biological examples in your answers. Why is positive feedback rarely observed?

Describe / contrast the BIOSYNTHESIS, storage and release of (1) a steroid hormone and (2) a peptide hormone. Describe / contrast the biosynthesis, storage and release of (3) a thyroid hormone and (4) a catecholamine hormone.

What biological activities are regulated by NO (nitric oxide). How is NO produced? What is the molecular action of NO on target cells?

What is the primary role of glucose in energy metabolism? Describe how the availability of glucose for energy metabolism is regulated in a homeostatic manner by glucagon and insulin. Suggest the adaptive significance of having protein and fat synthesis be stimulated by insulin. Describe the action of cAMP and phosphorylation on the regulation of glycogen to glucose.

Describe the thyroid pathway, including the roles and actions of cells in the hypothalamus, pituitary and thyroid gland. For each cell type involved ([1] hypothalamus, [2] pituitary, [3] thyroid gland, [4] T3 target), what are the properties of the (1) receptor system, (2) transduction mechanism and (2) response mechanism?

Describe the anatomy and cellular organization of the testosterone pathway, including the hypothalamus, pituitary and testis. What hormones are released from each cell type and what are
the general affects on their target cells? Describe the regulation of the testosterone pathway and the mechanisms of negative feedback by testosterone.

Describe the anatomical components of the estrogen/progesterone pathway, including the hypothalamus, pituitary, ovary and uterus. Describe the developmental events in the ovary and uterus and how these events influence what hormones are being produced. Describe the dynamics of interactions between LH and FSH secreting cells of the pituitary and estrogen secreting follicle cells of the uterus; describe the roles of negative and positive feedback.

Discuss the neural and hormonal control of arterioles in the regulation of blood pressure.

What are the sympathetic and parasympathetic nervous sub-systems? How are these different in function and chemistry. Describe the roles of these two nervous sub-systems in (1) regulating the heart and (2) regulating the arterioles.

Thoroughly describe the chemical/natomical pathways of CO₂ and O₂ between blood/RBC/Hb and tissues in your favorite organism away from the respiratory sites. What is the role of carbonic anhydrase? How does the transport of HCO₃⁻ out of the RBCs drive this reaction?

What is the difference between aerobic respiration and anaerobic respiration? What adaptations do animals take to survive under anaerobic conditions?

Discuss the relationships of animals, habitats and pathway of nitrogen metabolism. What evolutionary trends are apparent in nitrogen metabolism in terms of the adaptations of animals to terrestrial environments?

Compare the water balance problems of animals living in salt water, fresh water and terrestrial environments. What are the relative osmotic concentration differences between organism and environment in each case? In each environment, what factors create water balance problems and what strategies do organisms take in each environment to minimize these problems?

List 10 independent things that are regulated in the kidneys.

Describe the events that occur during an Action Potential. What factors contribute to (1) the rising phase, (2) the reversal, (3) the falling phase, and (4) the RP undershoot that occurs before the cell returns to its resting state. What are the molecular/electrical properties of voltage sensitive Na⁺ and K⁺ channels? What is “self inactivation” (what is the mechanism); do both the Na⁺ and K⁺ channels self inactivate? Why is it essential to have a “self inactivation” mechanism?

Describe the structure of G-actin and F-actin, including any specialized binding or enzymatic sites. How does F-actin form from G-actin? Compare the roles of actin as (1) a cytoskeletal element in all cells and (2) a contractile element in muscle.

Fully describe the structure of myosin as (1) a monomer, (2) a dimer and (3) a large polymer (thick filament). Include any special features, binding sites or enzymatic sites that contribute myosin function. What are the specific roles of ATP and Ca²⁺ in allowing muscle contraction?
Conservation Biology

Books:

People:

What is conservation biology and how is it distinguished from natural resource fields?

American conservation can be traced to three philosophical movements; discuss each.

How did Aldo Leopold’s approach transform American conservation?

Define biological diversity. Who first used the term?

How many species are there? How many have we described?

What is the IUCN Red List? What are the Red List categories?

What is the current rate of extinction?

What percent of species are threatened with extinction?

What is the primary reason we are losing species? Other contributing factors?

What is the Nature Conservancy’s Natural Heritage Program?

What is a population bottleneck? What is lost through a bottleneck that is of conservation concern?

Is there a relationship between genetic diversity and reproductive success/fitness? Discuss reasons why there may not be any relationship between the two.

Discuss the factors that can influence the loss of genetic diversity within a population.

What does the fixation index (Fst) measure?

Discuss the one-migrant-per-generation rule in conservation. Why is it a theoretically important concept in conservation?
What is inbreeding? What is inbreeding depression? When is it typically problematic?

What is the relationship between inbreeding and extinction?

How large should populations be to retain their evolutionary potential?

What is a minimum viable population (MVP)? Are there any data indicating how large?

What is demography? Discuss the differences between demographic stochasticity, environmental stochasticity and allee effects.

Discuss Lande’s (1988) paper titled “Genetics and demography in biological conservation” published in Science (it’s a classic). What’s the big picture point?

What are the primary effects of habitat fragmentation?

What is faunal collapse?

What species are most vulnerable to local and regional extinction?

What is a nested subset and how do they relate to the SLOSS reserves debate?

What is a metapopulation? A source? A sink?

Can you discuss an example where source/sink dynamics are important?

How useful are species-area curves in optimal reserve design?

Discuss the controversies/criticisms surrounding the listing of species by the Endangered Species Act.

Briefly discuss the history of the Endangered Species Act.

Authorization of the Endangered Species Act ended October 1, 1992. How has this effected its functioning?

Interspecific interactions in conservation focus on what kind of ecological effects?

In what ways do species losses affect community structure? Give an example.

Discuss some ways in which ecosystems respond to stress.

Evaluate the hypothesis that a large portion of native species richness is required to maximize ecosystem stability and function.

Discuss one example of an invasive species and its impacts.
Specific material related to your project:
Historical context of your topic (what, who and when). What were people in your field doing 20 years ago? What were the major questions of that time? Did they answer those questions? How does this relate to where your field is now?

Taxonomic and systematic relationships of your organism (both fine scale and course: e.g., what are the phylogenetic relationships among major groups of animals, and where does your genus/species fit?) This includes the estimated age of the species/genus/family, order, etc.

Natural history of your organism

Molecular and physiological mechanisms related to your topic

Techniques, methodology, and statistical methods related to your topic

What were the three most important seminars you heard in the last year? (These cannot be ones that anyone in your lab has given.) How did these seminars affect your thinking on your own research?

What are the three most important papers in your field and why? What are the three most over-rated papers in your field and why? What are the three most under-rated papers in your field and why?

Explain the major theoretical models relating to your question. What are the predictions and assumptions of each?
AB Pre-prelim Form

Name:__________________________________________

Each student should meet briefly with each committee member prior to the exams. During this meeting, expectations for both the oral and written exam should be discussed. For each committee member, please indicate which of the six areas (Ecology, Evolution, Behavior, Genetics, Physiology, and Conservation) s/he will cover. All committees should have representation from at least three areas.

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The following material lists the requirements of graduate students as stipulated by the Graduate College.

Graduate College Requirements:

http://www.grad.uiuc.edu/

http://www.grad.illinois.edu/gradhandbook

Graduate Degree Requirements

Registration Requirements:
In order to receive a graduate degree a student must be admitted to the degree program and enrolled in the program for at least one term after admission, which could be spring, summer or fall. To be counted toward the graduate degree, hours must be at the 400-level or greater and approved for graduate credit.

Residence Credit:
University of Illinois rules prescribe that a certain amount of credit hours for each degree received from this campus be taken as residence credit. Residence credit includes:

- graduate credit earned through an on-campus course at the University of Illinois at Urbana-Champaign,
- graduate credit earned through an Urbana-Champaign off-campus course or program,
- graduate credit transferred from the University of Illinois at Chicago or from the University of Illinois at Springfield,
- graduate credit earned through the CIC Traveling Scholar Program, and
- credit earned in the College of Medicine that is approved for application to the student’s graduate program for students in the Medical Scholars Program.

Residence requirements are outlined in Rule 3-801 of the Student Code.

Research Credit and 599:
A student cannot deposit a thesis without record of registration in research credit courses. Likewise, students with a record of registration in research credit will be required to deposit a thesis to complete their degree. Most departments use the course designation “599” to indicate research registration for both master’s and doctoral students. Graduate students should register for research credit during semesters when they are working on the thesis.

Departments may set criteria that determine at what point in the program students may begin registering for research credit (599). Registration in research credit must always be done with the approval of the student’s adviser.
The grade of DFR (deferred) is reported for research credit until the thesis has been completed, successfully defended if required, and deposited in the Graduate College. When a thesis is successfully defended and deposited, the DFR grades will be changed to S (satisfactory). If the student fails the final defense, the grade becomes U (unsatisfactory), and the thesis cannot be deposited.

If research credit is taken but thesis work is not completed, the 599 registration cannot be removed from the record. If the work will not be completed, the student must successfully petition for grades to permanently remain as deferred (DFR) in order to receive a degree. Students will not be certified for a degree with any grades of DFR in their academic record unless a petition has been approved.

**Graduation Requirements**

1. **Degree Conferral (Graduation Date):**
   Graduate degrees are conferred in May, August, and December.

2. **Applying for Graduation (Adding Your Name to the Degree List):**
   In order to receive a degree, a student must apply to be on the degree list for the appropriate graduation date. Students should apply for graduation using the UI-Integrate Self-Service system. Deadlines for applying to be on the list for each graduation date are noted on the [Graduate College Deadlines Web page](#). Applying for graduation is not the same as applying to participate in departmental or campus commencement ceremonies.

   A student may not receive a degree with a grade of I, NR, or DFR in any course except thesis research, on their graduate record without an approved petition.

3. **Theses and Dissertations:**
   A thesis or dissertation is an original, significant contribution to the scholarly literature of an academic discipline. In this section, “thesis” refers to both master’s theses and doctoral dissertations.

   All University of Illinois graduate students whose programs require the completion of a thesis must deposit their manuscript electronically in the Graduate College. Department approval and review of the thesis is required before it can be deposited.

   a. **Deposit.** The Graduate College does not require students to be registered at the time of deposit, but some departments may, so students should consult with their department before depositing. A thesis will not be accepted for deposit until all required materials have been submitted and all corrections requested by the Graduate College Thesis Office have been made. Deposit must be made by the appropriate master’s or doctoral deposit deadlines set for each term. There are no exceptions. Upon deposit, the thesis becomes part of the student’s academic record. No changes may be made to a thesis after it has been deposited at the Graduate College.
b. **Format.** The Graduate College will only accept theses that meet the formatting requirements set forth in the *Thesis Requirements*. Many departments have additional, discipline specific format requirements, and the Graduate College requires that all students secure format approval from their department prior to format review in the Graduate College Thesis Office.

c. **Dissemination.** Theses that are deposited as a requirement for the awarding of a degree are considered to be publications. Copyrightable works prepared by students as part of the requirements for a University degree program are deemed to be the property of the student.

As a condition of degree award, the University has the royalty-free right to retain, use and distribute a limited number of copies of the thesis, together with the right to require its publication for archival use (see *University of Illinois Board of Trustees’ General Rules*).

In order to best disseminate and archive the significant work of University of Illinois graduates, the Graduate College requires that every thesis and the abstract be published. The Graduate College will determine the method of publication that most effectively secures the existence of the thesis in perpetuity. The theses will be available to the public through the University Library.

d. **Permissions for previously published work included in the thesis.** Prior publication of parts of the thesis is increasingly common. If the copyright to the published work has been transferred to the publisher (or to any other party), the student should secure written permission from the current owner of the copyright to include the previously published material in the thesis to be submitted for deposit. Two copies of these copyright permissions should be included with the student’s deposit materials.

e. **Patent review.** If a student’s thesis contains potentially patentable information, a student may wish to have the thesis held by the Thesis Office while patentability is assessed. Holding a thesis does not postpone degree conferral or graduation. A student wishing to have a thesis held during the patent review process must contact the Office of Technology Management (OTM) prior to deposit. OTM will review the student’s request and notify the Graduate College if a thesis is to be held. Intellectual property is an important aspect of thesis research. See chapter I.C for more information.

4. **Request for Certification of Degree Letter:**
A student who has fulfilled all of the degree requirements before the next conferral date may need certification for employment or to meet visa requirements. To request a degree certification letter, the student should use the *Degree Certification Letter Request form*. A student who has not deposited the thesis with the Graduate College (when deposit is required), who owes money to the University, or who is enrolled in any course other than
research credit cannot receive a degree certification letter.

5. **Commencement:**
Commencement is a celebratory event, not a degree requirement. For details about participation, see the [Commencement Office](#) website.

**Master’s Degrees**

1. **Credit Hour Requirements:**
The Graduate College requires a minimum of 32 semester hours of graduate credit for the master's degree, although a number of programs require more. The Graduate College requires that at least 12 hours be at the 500-level or greater and approved for graduate credit (including thesis, research or independent study credit), and that 8 of these 12 hours be in the major. Half or more of the hours applied to a master's degree must be earned in courses counted for residence credit, (see chapter IV.A.4 and chapter III.C for more details and to see when transfer credit may count as residence credit). See [chapter IV.A.4](#) if enrolling for thesis research credit.

2. **Examinations:**
The Graduate College does not require a final examination or thesis committee for the master's degree. Departments that have such requirements determine their own rules for committee membership and administration of the examination. Master’s students are not required by the Graduate College to be registered during the term in which they take their final exam, but some departments may.

3. **Completion of Theses:**
The Graduate College does not require thesis deposit for the master's degree, however, many programs do. The Graduate College requires that a master's candidate depositing a thesis have an adviser who is a member of the [Graduate Faculty](#). In programs requiring a thesis deposit, the Graduate College does not require master’s students to be registered during the term in which they deposit, but some departments may.

The thesis adviser is required to sign the Certificate of Committee Approval (CCA); master’s thesis committee members are not required to sign, but may do so. Signatories must sign for themselves. Department heads are also required to sign the CCA. Persons authorized by the department to sign CCAs (as recorded on the Authorized Signatures Form filed with the Graduate College) may sign in place of the department head. The signature of the department head, or authorized signatory, is an assertion of the authenticity of the adviser signature and of the acceptability of the thesis to the department; therefore, this signature must be original (wet). All required signatures must be submitted to the Graduate College on the same form in support of the thesis deposit.

4. **Time Limits:**
A master's degree candidate is expected to complete all degree requirements within five years of first registering as a degree-seeking student in the master’s degree program,
unless the student is enrolled in a program with a different time limit that has been approved by the Graduate College. Students may request an extension of this time limit through the Graduate College petition process up to one year prior to the degree conferral date.

If course work to be used toward the degree is more than five years old at the time of degree conferral, students must petition the Graduate College asking that the course work be accepted for the degree. The petition must include an explanation from the department regarding how the student's knowledge in the areas covered by the old course work meets current standards. This justification is needed for degree certification, and the petition can be filed up to one year prior to the degree conferral date. With written approval of the Graduate College, a department may set different time limits for completion.

Requirements and Policies for Doctoral Degrees

Credit Hour Requirements

Doctoral degrees require successful completion of a minimum of 96 semester hours of graduate credit (see section C of this chapter for doctoral degree stages), except for those programs approved otherwise. Doctoral degrees also require successful completion of the preliminary and final examinations.

Doctoral degree candidates, regardless of transfer credits or a master's degree completed elsewhere, must complete at least 64 hours of residence credit (IV.A.4) out of the total of 96 hours required for the doctoral degree, and should also see chapter III.C for information about transfer credit. Thesis hours count toward residence credit.

Registration Requirements

The Graduate College does not require that students be registered to take preliminary examinations, nor does the Graduate College require students to be registered at the time of deposit. However, individual departments may have registration requirements, so students should check with their department for details. The Graduate College does require that all doctoral candidates be registered for the entire academic term during which they take the final examination, regardless of when the dissertation will be deposited or when the degree will be conferred. For this purpose only, "academic term" is defined as extending to and including the day before the first day of the following academic term. If enough thesis credits have been accumulated, registration for zero hours is acceptable. See chapter II.B.4.c. for more information about enrollment in GC 599 for loan deferral. For students in approved joint degree programs and in the Medical Scholars Program, registration in either program during the academic term in which they defend meets the enrollment requirement.
Doctoral Degree Stages

The doctoral degree is commonly thought of in three phases or stages of progress, with each stage having unique components and milestones. Departments usually have specific tasks and requirements in each stage.

Stage I: A doctoral student is considered to be in Stage I from initial enrollment in the Graduate College to completion of a master’s degree or its equivalent. Transfer credit can only be applied to Stage I. Each department should have a procedure for evaluating a student's progress at this first stage of doctoral work. Elements of this evaluation will include GPA, along with other factors related to good academic standing and satisfactory progress (III.B). In some departments, this evaluation may take the form of a qualifying examination, or other examination or series of examinations, which a student must pass before entering Stage II of the doctoral degree program. Evaluation of progress in Stage I, whether by examination or other formal review, should take place no later than the end of the second year after a student enters the doctoral program. The evaluation results should be communicated in writing to the student. Students who apply to a doctoral program having already completed a master's degree equivalent to that awarded by the University of Illinois are generally considered to have completed Stage I of the doctoral program unless the department deems otherwise, in which case the department must notify the student of the stage in which they are entering the program.

Stage II: A doctoral student is considered to be in Stage II from completion of the master’s degree or equivalent to completion of all departmental requirements (except the defense and deposit of the dissertation), including passing the preliminary examination. In some programs, doctoral students entering with a master’s degree will take a qualifying examination early in Stage II. Stage II usually consists of one or more years devoted to course work and research in preparation for the preliminary examination. A student who passes the preliminary examination has completed Stage II and is often referred to as being "ABD" (all but dissertation). A student who has completed Stage II is formally a candidate for the doctoral degree.

Stage III: Stage III is the time from the completion of Stage II to passing of the final defense and deposit of an approved dissertation. See the Graduate College Deadlines Web page for deadline dates for final examinations and deposits.
Doctoral Committees and Examinations

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<thead>
<tr>
<th>Qualifying Examination Committee*</th>
<th>not required by the Graduate College</th>
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<tr>
<td>Preliminary Examination Committee</td>
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<th>Doctoral Committee</th>
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<td>not required by the Graduate College</td>
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| Final Examination (Defence) Committee | Yes | Yes** | 4 | 3 | 2 |

*(Note: Committee nomenclature may vary by department; for example, the qualifying exam is sometimes called a "comprehensive" exam.

** See V.II Registration Requirements.

1. **Qualifying Examination and Qualifying Examination Committee:**
   The Graduate College does not require qualifying examinations, but departments may. Qualifying exams, usually given at the end of Stage I of the doctoral work (see chapter VI.C), evaluate the student's knowledge in the field and preparation for the doctoral program. The format of these examinations may be written, oral, or both, as determined by the program. The program must clearly communicate information about the format and rules (i.e. closed-book) to all students in advance. Departments may internally appoint committees to conduct these examinations.

2. **Preliminary Examination and Preliminary Examination Committee:**
   The preliminary examination is required for completion of Stage II of graduate study. Preliminary examinations may be oral or written or both, depending on the unit's policy, and generally evaluate the student's overall and specific knowledge in the field. Preliminary examinations also usually include an oral presentation to review the feasibility and appropriateness of a student's dissertation research proposal. The doctoral degree program prescribes the scope, format and procedures associated with the examination. The program must clearly communicate information about the format and rules (i.e. closed-book) to all students in advance.

The preliminary examination is conducted by a committee appointed by the dean of the Graduate College upon recommendation of the executive officer of the unit. In some units the same committee acts for all students taking preliminary exams in a given year. In other units, the preliminary examination committee may be comprised at least in part of those members who will serve on the student's dissertation or final examination committee.

In either case, the committee must include at least four voting members, at least three of which must be members of the Graduate Faculty, and two of which must also be tenured.
Individuals who are not members of the Graduate Faculty who will be voting members of the committee must be approved in advance by the dean of the Graduate College. To request approval, a curriculum vitae for the individual and a justification from the chair of the committee should accompany the request for appointment of the doctoral committee.

The Policy on Graduate Faculty Membership allows the tenure requirement to be met by term members of the Graduate Faculty who retired or resigned with tenure for a period of five years following the resignation or retirement, if requested by the unit executive officer.

Non-voting members may be appointed but are rare on preliminary examination committees.

The process for selection of committee chairs varies by unit.

The student and committee chair must be physically present for any oral presentation (e.g. presence by teleconference is not acceptable). Ideally all committee members should be present. In exceptional circumstances, the Graduate College allows up to two voting members to participate via electronic communication media such as speaker-phone or video-conference link. Students wishing to take advantage of this option should seek approval from the department.

Decisions of the preliminary examination committee must be unanimous. The committee may make one of three decisions:

- pass the candidate,
- fail the candidate, or
- defer the decision. This option should be used only if the committee intends to hold another examination within six months, and that date should be included on the form.

The result of the examination is communicated to the student and to the Study Abroad, Graduation and Graduate Support unit of the Office of the Registrar as soon as possible at the conclusion of the exam. If this office is not informed of the result of the preliminary examination within six months after the scheduled examination date, the committee is considered dissolved. If the examination took place, but the committee failed to submit the results within six months, a petition must be submitted to the Graduate College requesting that the result be accepted from the committee after the 6-month deadline (see, www.grad.illinois.edu/PetitionInstructions). If the examination did not take place within six months of the scheduled date, then a new committee must be appointed before the examination occurs. The newly appointed committee may, but does not have to, consist of the same members as the dissolved committee.

3. **Dissertation Committee:**

   The dissertation committee does not need to be formally appointed or approved. The purpose of this committee is to advise the student with dissertation research and effectively monitor the student's progress, often before the student is ready to form the final examination committee. The Graduate College encourages formation of a
dissertation committee as early as possible after the successful completion of the preliminary examination. In units with preliminary examinations that include the presentation of a proposal for the doctoral research, the dissertation committee membership may be substantially the same as the preliminary examination committee. The dissertation committee membership may also be the same or essentially the same as the final examination committee. There is no time limit on the duration of service of the dissertation committee, other than the length of time that the student is allowed to complete the degree.

4. Final Examination and Final Examination Committee:
The final examination committee is appointed by the dean of the Graduate College, upon recommendation of the unit executive officer. The student's dissertation adviser (or director of research) need not be the chair of the committee. The chair of the final examination committee must be a member of the Graduate Faculty. The final examination committee chair is responsible for convening the committee, conducting the examination, and submitting the Certificate of Result of Final Examination to the department in which the student is enrolled and to the Study Abroad, Graduation and Graduate Support unit of the Office of the Registrar. A contingent chair, who must also be a member of the Graduate Faculty, may be designated to serve as the chair of the final examination committee should the original chair be unable to serve for any reason.

Committee members should be chosen for their expertise in the student's research area, but may also be chosen to give diversity in viewpoint, methodology, or academic discipline. Such diversity may be achieved by including members from more than one sub-discipline within the department, from other departments, or from other institutions. The faculty of a department may establish procedures or requirements for introducing diversity in the membership of the final examination committee. Students must adhere to departmental procedures or requirements. These procedures and requirements must be clearly communicated to all students in advance of the exam.

The final examination committee must include at least four voting members, of which at least three must be members of the Graduate Faculty and at least two must be tenured.

- Individuals who are not members of the Graduate Faculty who would like to be voting members of the committee must be approved in advance by the dean of the Graduate College. To request approval, a curriculum vitae for the individual and a justification from the chair of the committee should accompany the request for appointment of the doctoral committee.
- The tenure requirement can be met by term members of the Graduate Faculty who retired or resigned with tenure for a period of five years following their resignation or retirement, if requested by the unit executive officer.
- Upon departmental request, the dean of the Graduate College may also appoint non-voting members to doctoral committees, such as an external reader, an Urbana-Champaign faculty member who is on leave, or others who have made a significant contribution of academic guidance in the dissertation process.
If there are more than four voting members on the committee, at least half of the voting members should be members of the Graduate Faculty.

Note: If more than five years elapse between a doctoral student's preliminary and final examinations, the student is required to demonstrate that his or her broad knowledge of the field is current by passing a second preliminary examination (see Time Limits in chapter VI.E for details).

The committee chair and the defending student must be physically present at the final examination (e.g. presence by teleconference is not acceptable). Ideally, all voting members of the committee must be present at and participate in final examinations. In exceptional circumstances, the Graduate College will allow up to two voting members to participate via electronic communication media such as speaker-phone or video-conference link. Students wishing to take advantage of this option should seek approval from the department. Non-voting members do not need to be present at the final examination.

As a crucial milestone in a student’s doctoral experience at Illinois as well as a significant event within the campus scholarly community, the final examination should take place on campus. Final examinations are oral and open to the public.

Decisions of the committee for final examinations must be unanimous and are recorded on the Certificate of Result. The committee may make one of four decisions:

- pass the candidate with no revisions required,
- pass the candidate pending revision of the dissertation; the candidate will receive the signed Certificate of Committee Approval when the prescribed revisions have been completed,
- defer the decision; this option should be used only if the committee intends to hold another defense within six months of the first defense date, and registration is required during the semester when a second defense is held, or
- fail the candidate.

Students who fail the first exam may, at the discretion of the committee and according to departmental rules, be granted another opportunity to take the examination after completing additional work. The chair will inform the Graduate College if the student is allowed a second examination.

5. **Certificate of Result:**
The Certificate of Result verifies that the student has completed the final examination, regardless of the outcome. Original signatures are required on the Certificate of Result; signatories must sign for themselves. Only the voting members of the final examination committee sign the Certificate of Result.

The result of the examination is communicated to the student and to the Study Abroad, Graduation and Graduate Support unit of the Office of the Registrar as soon as possible at
the conclusion of the exam. If this office is not informed of the result of the final examination within six months after the scheduled examination date, the committee is considered dissolved. If the examination took place, but the committee failed to submit the results within six months, a petition must be submitted to the Graduate College requesting that the result be accepted from the committee after the 6-month deadline (see, www.grad.illinois.edu/PetitionInstructions). If the examination did not take place within six months of the scheduled examination date, then a new committee must be appointed before the examination occurs. The newly appointed committee may, but does not have to, consist of the same members as the dissolved committee.

6. **Certificate of Committee Approval:**
All voting members of a doctoral student’s final examination committee are required to sign the Certificate of Committee Approval (CCA); signatories must sign for themselves. Non-voting committee members are not required to sign, but may do so. Department heads are also required to sign the Certificate of Committee Approval. Persons authorized by the department to sign CCAs (as recorded on the Authorized Signatures Form filed with the Graduate College) may sign in place of the department head. The signature of the department head, or the authorized signatory, is an assertion of the authenticity of the committee signatures and of the acceptability of the dissertation to the department; therefore this signature must be original (wet). Because the CCA asserts a unanimous decision in favor of acceptability of the dissertation, all required signatures must be submitted to the Graduate College on the same form in support of the dissertation deposit.

**Full-Time Course of Study for Graduate Students**

Graduate students may be required to maintain full-time enrollment for several reasons. Many academic programs require registered students to maintain a full-time load. Full-time status may also be required for certification related to student loans, fellowship and traineeship appointments, and certain types of non-University medical insurance policies. International students may be required to maintain full-time status for purposes of Student Exchange and Visitor Information System (SEVIS) reporting.

**Graduate students with 25%-67% assistantships, except Fellows (see below)**

- Fall and spring terms: a minimum of 8 graduate hours; individual programs may set higher requirements.
- Summer term: a minimum of 4 graduate hours in thesis units or a course that meets for at least eight weeks (enrollment in a four-week course in the summer term will not fulfill the requirement for full-time registration)

**Graduate students with waiver-generating traineeships or fellowships (regardless of whether the student holds a concurrent assistantship) and graduate students with courtesy fellowship tuition waivers**

- Fall and spring terms: a minimum of 12 graduate hours
• Summer term: a minimum of 4 graduate hours in thesis units or a course that meets for at least eight weeks (enrollment in a four-week course in the summer term will not fulfill the requirement for full-time registration)

Graduate students with 1%-24% assistantships and graduate students without assistantships

• Fall and spring terms: a minimum of 12 graduate hours
• Summer term: a minimum of 6 graduate hours in thesis units or a course that meets for at least eight weeks (enrollment in a four-week course in the summer term will not fulfill the requirement for full-time registration)

Important Notes

Fellows are required to maintain a full course load each term of registration unless a reduced course load has been approved by the Graduate College Fellowship Office. Fellows who are international students must also have a reduced course load approved by International Student and Scholar Services.

For purposes of load, each required or recommended ESL course taken as a result of the English as a Second Language Placement Test (EPT) or the SPEAK Appeal will count as the equivalent of 4 graduate hours, even if the course credit is recorded as zero hours.

International students whose first term of study is the Summer term must carry a full course load. In some cases, U.S. Citizenship and Immigration Services considers a student to be full time at a reduced enrollment. International students should check with International Student and Scholar Services for details or go to isss.illinois.edu/students/guidelines.shtml.

Continuing international students are not required by the campus to enroll for the summer terms, although their departments may require enrollment. Those who do enroll do not need to carry a full course load for SEVIS purposes.

International graduate students who have completed all credit requirements (course work and thesis research) for their degree programs may register for zero hours of 599 until completion of study. This registration will be considered full-time for purposes of SEVIS reporting. International students seeking any exception to the full-time credit requirements should contact the International Student and Scholar Services before registering for the reduced credit load.

For purposes of loan deferral only, zero credit registration in GC 599 will count as full time registration.

Graduate students not registered for at least a half-time load in a particular term will be subject to Social Security and Medicare deductions for that term.

Students with specific loan repayment questions should consult their lenders (school, bank, or loan agency). Students with questions about their fellowships or traineeships should consult the
Graduate College Fellowship Office or the funding agency. Students with questions about certification of full-time status should contact the Office of Admissions and Records. Questions about the requirements of specific academic programs should be directed to the graduate office for that program.