Ph.D. and M.S. in Evolution, Ecology and Behavior and PhD Minor in EEB Department of Biology, Indiana University, Bloomington (Last updated by RPP in July, 2022 and SRH, Aug 2022)

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I. PhD PROGRAM IN EVOLUTION, ECOLOGY, AND BEHAVIOR

Introduction:

The Doctoral (Ph.D.) degree in the graduate program in Evolution, Ecology, and Behavior (EEB) may be obtained in a variety of concentration areas or in an individually tailored program. In addition to the specific requirements of the EEB Program described below, students must meet the general requirements of the Department of Biology and those of the University Graduate School (UGS), as described in the Bulletin. All new students and students approaching critical milestones (First Committee Meeting, Qualifying Examination, Finishing Thesis or Dissertation) should consult the Bulletin to be sure they are in compliance with relevant rules. It is the *student's responsibility* to make certain that their program meets their personal objectives and conforms to the regulations and requirements of the Graduate School, of the Department of Biology, and of the EEB Program.

Program Overview:

Students in the PhD program follow a typical timeline (Figure 1). This timeline governs the structure of the material in this handbook. See also the summary Table 1 (page 14, below) and the EEB Checklist form.







EEB Faculty:

EEB Graduate Faculty are composed of 21 scientists, listed on the Biology website.



EEB Grad Program Contact:

Biology Advisor for Graduate Affairs: Katie LaPadula, Myers 150, biogrdav@indiana.edu, 6-5522

EEB Graduate Program Director (GPD): from July 1, 2021 Rich Phillips, rpp6@iu.edu, eebgpd@indiana.edu, 6-0593, BB 247

Interim GPD for AY 22-23: Spencer Hall (sprhall@iu.edu) 5-6009

Director of Grad.Studies (DGS), Biology: Heather Reynolds, BB 155A, biodgs@indiana.edu, 5-0792

Key Abbreviations: *GPD*: Grad Program Director; *DGS*: Director of Graduate Studies of Biology; *UGS*: University Graduate School; *CGO*: College Graduate Office; *NORC*: Nomination of Research Committee

(1) Coursework (typically 1st & 2nd years of study, 3rd sometimes)

(A) Formal Course Credits:

A total of 90 credit hours comprised of $\underline{29+}$ formal class course credits is required by the EEB Grad Program. Course credits include:

(1) a **20 credit 'major'** (composed mostly of EEB courses, with exceptions approved by the EEB Graduate Program Director [GPD]), including two courses from one concentration area listed in **Box 1** and one course from a second area (the '**2 and 1 rule**'), and 2 credits of Brown Bag;

(2) a **6+ credit 'minor'** (taken within Biology or through another department: credits vary from 6 to 12; see **Box 2**); and

(3) a **3 credit statistics** class (S681 Biometry or equivalent agreed upon by Advisor Committee).

Up to six credits in the **'major'** may come from three sources:

- (A) Z620 "journal clubs" (some Z620s are courses, not journal clubs)
- (B) L500 Independent Study/Readings (graded), and/or
- (C) L501 Rotations (graded).

L500/L501 credits require written summaries approved by the students' graduate advisor(s) and Advisory committee using the form at the 'EEB Grad Docs' folder on IU Sharepoint/One Drive. Not more than four credits may come from any of sources (A) - (C), i.e., the **'4 and 6 rule'**.

Box 1: Concentration area courses Ecology/Population Biology E455/556 (SPEA) Limnology L575 Biodiversity and Eco. Functioning L577 Theoretical Ecology L578 Advanced Population Biology L579 Community Ecology L591 Plant Population Biology-An Experimental Approach Z620 Advances in Ecosystem Science Z620 Ecological Niches Z620 Ecological Stoichiometry Z620 Ecosystems and Global Change Z620 Quantitative Biodiversity Z620 Ecological Plant Physiology Z620 Disease Ecology and Evolution

Evolutionary Biology L505 Molecular Biology of Evolution L567 Evolution L568 Evolutionary Genetics L533 Evolution of Genes and Genomes L534 Evolution of Cells and Proteins Z540 Genetics of Structured Populations Z620 Ethics, Race, and Population Genetics Z620 Evolution of Development Z620 Phylogenetics Z620 Systematics Z620 Evolution of Populations Z620 Disease Ecology and Evolution I590 (INFO) SNP Discovery and **Population Genetics** G562 (Geo Sci) Geometric Morphometrics

Behavior/Physiology

A501 Techniques in Repr. Diversity L553 Sensory Ecology L560 Physiological Ecology L581 Behavioral Ecology Z460 Animal Behavior Z466 Endocrinology Z563 Comparative Neurobiology of Animal Behavior Z566 Laboratory in Endocrinology P548 Neuroethology

Note 1: Other courses may be approved by Advisory Committee, and then GPD

Note 2: Only a subset of these classes are offered every year

Box 2: Description of the minor¹:

- Each EEB student must complete coursework for a minor. The minor may be obtained from:
 - within Biology (Genetics or Microbiology, which also has Bacteriology and Virology)²,
 - a separate department (e.g., Informatics, Statistics, Environmental Science from SPEA, Geology, Geography, Education, typically best described in the UGS Bulletin),
 - an interdepartmental program (e.g., Animal Behavior), or
 - an 'Individualized minor'.

EEB will waive the 3 credit requirement in statistics for students minoring in Statistics (12 credit).

¹*Please note:* Requirements are set by the unit administering the minor but consist of a minimum of 6 credits up to a maximum of 12 credits. Each student must have a minor advisor, who ensures requirements for the minor are completed successfully.

² Advisors for the **Genetics minor** include <u>Core</u> (top) and <u>Affiliated</u> (bottom) members of GCDB Grad program but also these EEB Faculty: *Bracewell, Delph, Hahn, Knox, Lively, Moczek, Moyle, Ragsdale, Wade* (per 5/12/2016 policy). Advisors for the **Micro minor** include <u>Core</u> (top) and <u>Affiliated</u> (bottom) members from the Micro Grad program.

Brown Bag requirement: Additionally, two credits in the major should come from L570 'Brown Bag' (formally: 'Seminar in Ecology and Environmental Biology'; 1 credit per semester, so enroll 2+ times, typically done in the first year, but perhaps taken one semester each in the first two years).

(B) Grade Requirements for Courses:

Only grades of 'B-' or higher fulfill EEB major or minors (but all courses count in the overall GPA). Students must maintain a 3.2 GPA or higher to receive support from Biology (as Associate Instructors or from Internal Fellowships). The University Graduate School requires a cumulative GPA of 3.0 or higher. Students not meeting this UGS requirement are placed on Academic Probation. (If placed on probation, students must raise the cumulative GPA above 3.0 during the next semester or face dismissal from the Graduate School).

(C) Research Credits:

(i) *L800 Credits*: Remaining credit hours come from dissertation research (L800). Most 1st-3rd year students should have a total of 12 credits per semester - so L800 credits typically are added to formal course credits to reach 12. Fourth year students must have at least 6 credits (L800).

(ii) *G901 Credits:* After 90 credits have been taken and students become PhD Candidates (i.e., formal coursework is completed, Qualifying Exams Part 1 and 2 are passed), students may enroll in G901 Advanced Research to maintain 'active status'. This 6 credit course has very low fees (c. \$150/semester), providing an inexpensive way for some students, typically funded on fellowships or research assistantships, to maintain a full load. (Students typically want to take G901 credits whenever possible to reduce fees that they must pay. However, their access to campus services becomes reduced [CAPS, gym, legal services] without payment).

(iii) *Grading of Research Credits:* Passing grades in research courses for work done toward Ph.D. dissertation will be graded R (= evaluation deferred) until the research project is complete (i.e., the dissertation is defended and all requirements are met). A total of 90 graduate credit hours or the equivalent is required. Because the Ph.D. is a research degree, a substantial number of these credit hours will be in L800 Research.

(D) Transfer of Graduate Credit:

Graduate work taken elsewhere may qualify for transfer credit toward the Ph.D. and may be substituted for required or elective courses. The appropriateness of proposed substitutions will be determined by the student's Advisory Committee. No more than *30 credits* by transfer can be accepted for the Ph.D. Any courses which become 7 years or older by date of candidacy must be revalidated by UGS.

Any changes described here to course requirements can (but do not have to) apply retroactively.

(2) First year expectations, beyond coursework

(A) Mentoring of First-Year Students: During the first semester of the PhD, each new student must meet at least once with his/her/their faculty mentor (typically the advisor). This meeting should happen at six to eight weeks into the semester, then again at the end of the semester. At this meeting, student and mentor to discuss progress in courses and rotations and, where relevant, the Associate Instructor experience. In addition to these required meetings, the student is encouraged to meet with his/her/their mentor as useful.

(B) Research Area, Research Advisor, Committee Meeting: In their first year, Ph.D. students make a preliminary choice of a thesis research area, select a faculty research sponsor (advisor), and form an Advisory Committee. Before the end of their second semester (early May), students should meet with their Advisory Committee at least once to determine course work requirements, review plans for summer research, and discuss plans for Qualifying Examination Part 1: Breadth of Knowledge. Students must have joined a lab before the end of May in order to remain in good standing in the program.

(C) Your Research Advisor: Each student must obtain the agreement of a faculty member in the Department of Biology to serve as the Ph.D. Research Advisor. (Students do not 'choose' an advisor; they form an agreement for a student-advisor relationship). Until the student forms that agreement with an Advisor, the EEB Graduate Program Director will serve in that role. The Advisor will help the student plan a coherent program of courses and research commensurate with the student's interests and the requirements of the program, and will oversee the formation of an Advisory Committee. A Research Scientist can serve as an advisor, but the University Graduate School requires a tenured co-advisor unless the RS is "endorsed to direct dissertation committees" (as explained on the UGS website <u>here</u>).

(D) Advisory Committee: The Advisory Committee must consist of four or more members, at least two of which must be full members of the Graduate Faculty. The Advisory Committee must also include at least two faculty from EEB and one from the minor area. In practice the Advisory Committee is usually chosen by mutual agreement between the Advisor and the student. The student then contacts the potential Committee members to obtain their agreement to serve on the Advisory Committee. Box 3 describes both the Advisory Committee (pre-Candidacy) and Research Committee (post-Candidacy) in more detail.

(E) Annual Individual Development Plan (IDP): Each student must complete an Individual Development Plan (IDP) annually, in consultation with their advisor(s). The completed IDP should be submitted to: (1) your graduate advisory committee at least 1 week before your annual meeting, and (2) your IU online folder, along with a copy of your most current C.V. The IDP form can be found in the EEB Grad Docs Folder.

(F) First Committee Meeting: Goals The first meeting of the student's Advisory Committee must be convened before the end of the second semester of study in the Ph.D. Program. At this meeting, students:

- * discuss goals and intended area of concentration,
- * review her/his/their past graduate course work and plan additional course work,
- * review her/his/their Individual Development Plan (IDP), and
- * review research plans for summer and beyond in prep. for Qualifying Exam Part 2 "Research Skills".

At this time the Advisory Committee will identify any deficiencies in course work. At the Advisory Committee's judgement, deficiencies may include any basic requirements not already satisfied, as well as additional courses in biology, chemistry, or other academic areas, or the learning of ancillary skills such as statistics or computer science. The Advisory Committee will also decide the time for, and schedule of, the student's Qualifying Examination part 1 'Breadth of Knowledge'. As of Spring 2020, for the final portion of the annual Advisory Committee meeting, the chair (advisor or co-advisors) will be invited to leave the meeting, giving the student an opportunity to seek input from their non-chair committee members. This procedure is detailed in the 'EEBAdvisoryCommitteeMeetingProcedure' document, in the EEB Grad Docs Folder.

Form for Advisory Committee: The College's <u>Appointment of Advisory Committee eDoc</u> is typically submitted to the College Grad Office after this meeting. (They provide a change of committee form, too).

Committee meeting report: After the committee meeting (and each one subsequent), advisors should fill out the committee meeting form, and email it to the Graduate Advisor and EEB GPD, to be saved in the student's online Biology Dept folder. It is the advisor's and student's joint responsibility to ensure that this form is completed.

Box 3: More about Advisory and Research Committees

1. The pre-Candidacy 'Advisory Committee' rules (set by UGS) require that each student select four committee members, one member who can be from outside IU. The Advisory Committee is generally more flexible than the 'Research Committee', which is formally established with UGS after the student has advanced to candidacy. The rules for the Research Committee (also set by UGS) require that each student formally select four committee members. Each member must be on IU's are <u>Graduate Faculty</u> list (i.e., Research Scientists can serve if they're on the list) and at least two members must be "endorsed to direct dissertations' (defined <u>here</u>). Two or more members of the Research Committee must be from EEB.

2. For the Research Committee, students can still have a 5th **outside member**. Typically, this member provides particular expertise to the committee not available at IUB.

3. Committee meetings, held annually (once per academic year) require a **quorum** (three for a committee of four or five), present either in person or electronically. A quorum is required for preliminary exams parts 1 and 2. <u>All</u> members must be present for dissertation defenses (as required by UGS – exception noted in the Appendix).

4. As of Spring 2020, for the final portion of each annual Committee meeting, the chair (advisor or co-advisors) will be asked to leave the meeting (with the exception of the year 2 meeting, which is typically when part 1 of the Qualifying Exam takes place), giving the student an opportunity to seek input from their non-chair committee members. This procedure is detailed in the 'EEBAdvisoryCommitteeMeetingProcedure' document, in the 'EEB Grad Docs' folder.

5. Before becoming a candidate (1st and 2nd year), students must recruit a **'Minor Advisor**'. The Minor Advisor must have authorization to approve the minor coursework through the minor's home department or graduate program. This Minor Advisor must remain on your committee at least through written prelims (Qualifying Exam, part 1). This Minor Advisor provides one of the four written questions in that exam (since the minor is represented on the exam).

6. After Qualifying Exam part 1, **committee membership can be changed**, if desired. For instance, it may be preferable to replace the Minor Advisor with an EEB faculty for Qualifying Exam part 2 proposal defense or beyond. The key point: *Advisory Committee membership is flexible*. If you make changes, please update the Advisor for Graduate Affairs and resubmit your Advisory Committee form to the College Grad Office.

7. Usually after Candidacy but no later than Spring of the fourth year of study, students solidify membership of the Research Committee with UGS, using the '<u>Nomination of Research Committee</u>' form, aka, the **NOR form**. Changes to committee makeup afterwards require submission, via the '<u>Change of Research Committee</u>'.

8. **IMPORTANT: Requirement for Annual Meeting and 'Good Standing':** Each student must hold a committee meeting at least once per academic year - defined here as Aug 1st to July 31st - to remain in 'good standing' with the EEB Graduate Program. The results of this meeting must be reported on the <u>committee report form</u>, saved to the <u>student's IU folder</u> on OneDrive, and sent to the Graduate Office and GPD. Students should also report the meeting to the Advisor for Graduate Affairs to ensure paperwork is completed. At the annual meeting, students must maintain 'satisfactory' academic progress toward the degree, a standard set by the Research Committee and the EEB Graduate Program. Students not meeting this standard are not in 'good standing' and placed on academic probation for one semester by UGS. If the student does not demonstrate progress during that probation, UGS will dismiss the student.

(3 and 4) Years 2 and 3: Qualifying Examinations

(A) Overview:

The Ph.D. qualifying examination aims to determine preparation for independent research. It is difficult to assess the ability to do creative, rigorous research. The Committee will thus look for:

- * a solid background in relevant basic biology and the physical sciences;
- * familiarity with and ability to manipulate important concepts in EEB, especially the ability to derive from them a significant question for research;

- * the ability to structure experiments or observations in such a way as to answer questions unambiguously;
- * the ability to analyze correctly and to interpret creatively the results of experiments or observations;
- * the ability to derive the next step in the process of investigation; and
- * the ability to communicate effectively with other scientists orally and in writing.

The exam is structured in two parts, typically taken in years 2 and 3 separately.

Structure of the Qualifying Examination, Parts 1 and 2

Part 1. Breadth of Knowledge: A written examination with an oral defense.

- Students demonstrate mastery of the major ideas and research strategies appropriate to the concentration area, as well as mastery of effective written and oral communication.
- Questions are formulated by the Committee members and given to the student on the first day of a six week written examination period.
- This part must be passed <u>prior</u> to the <u>13th week</u> of the student's <u>fourth</u> semester in the EEB program.

Part 2. Research Skills: *A preliminary research project report, a proposal for dissertation research, and an oral defense of both.*

- Student demonstrate ability to engage in active research and to appropriately analyze and interpret the data that she/he derives. In addition, it is the point at which the committee must approve the dissertation proposal.
- -This part must be passed prior to end of the student's sixth semester in the EEB program.

See below for details on each exam. The outcome of each exam must be reported using the committee meeting form. The IDP and advisor-free period is not used during part 1.

(B) Retake Option

In the event of failure of the exam prior to the deadline, a student may retake each component only once. This retake must be completed before the deadline specified for that component. *Failure to pass either part satisfactorily within the allotted time during the retake will result in dismissal from graduate study*. Students who fail the examination must be reexamined by the same committee unless the student has changed advisors. In that event, a majority of the new committee must have been members of the original committee.

(3) Year 2: Qualifying Examination Part 1, 'Breadth of Knowledge'

Please also see the <u>FAO</u> for this exam.

(A) Format

- 1. *Number of questions*: Students will research and prepare written answers on 4 questions chosen by their advisory committee during a 6-week period of study.
- 2. *Length of answers*: The written answers to each of the 4 questions are to contain full text citations and to be 4-6 double-spaced pages in length (not to exceed 2000 words).
- 3. *References cited*: A References Cited section must accompany each written answer and shall not count toward the page/word limit.

4. *Nature of the answers*: Answers should exhibit the student's proficiency at synthesizing the literature and at staking out their own intellectual positions, rather than being a simple summary of all literature and ideas relevant to the question.

5. Timing:

- A. <u>Submission of answers</u>: The 4 written answers will be turned in to the major advisor on the day following the 6-week period.
- B. <u>Timing of oral exam</u>: An oral exam will be scheduled within 1 week of the end of the 6-week study period. After a question and discussion period during the oral exam, the major advisor will facilitate discussion among the faculty examiners about the student's performance and the committee will decide the exam outcome.
- C. <u>Structure of oral exam/2nd year committee meeting</u>: As of Spring 2020, for the final portion of each annual Advisory Committee meeting, the chair (advisor or co-advisors) will be invited to leave the meeting **with the exception of the 2nd year committee meeting** (that is, Part I of the Qualifying Exam). This procedure is detailed in the 'EEBAdvisoryCommitteeMeetingProcedure' document, in the 'EEB Grad Docs' folder.

(B) Breadth:

The 4 exam questions shall encompass at least three different areas relevant to the student's research scholarship, including the student's core area (e.g. Evolution, Ecology or Behavior) and the minor. Appropriate areas include but are not limited to ecology, evolution, behavior, physiology, neuroscience, and development. Any given question may bridge more than one area.

Although the questions are designed to assess breadth of knowledge, they can be related to the student's specific research project(s). As one example, an evolution question for a plant ecology graduate student working on plant-microbe interactions might focus on coevolution between plants and microbes. Likewise, a behavior question for the same student might address some aspect of plant 'behavior', such as mechanisms of information exchange between or within plants or between plants and other organisms. Such questions can be tailored so that the student also needs to explore and articulate general concepts in the area (e.g. Wright's adaptive landscapes, levels of selection, Tinbergen's 'Four Questions'). This approach will foster well-rounded graduate students who are able to think outside the box of their own specialty, understand the relevance of other major disciplines to their own research interests, and synthesize knowledge across fields.

(C) Role of major advisor:

The major advisor will be responsible for writing no more than 1 question and soliciting 2 exam questions from each of the 3 other committee members, for a total of 7 questions. Questions should be solicited sufficiently in advance of the exam period. The major advisor will lead the decision-making about which areas each committee member provides questions on and should review the questions and suggest or request modifications as necessary, including the possibility of merging questions from the original 7 questions that encompass at least 3 different areas and the committee as a whole will have final approval of the 4 questions. The major advisor shall provide a written copy of the questions to the graduate examinee on the first day of the 6-week exam period.

(D) Report of Decision:

Following the oral exam, the major advisor will provide a detailed summary of the committee's

decision, including an assessment of strengths as well as any areas for continuing progress. A written communication of this summary (using the committee meeting form) should be recorded on the sent to the Grad Advisor (biograd), the EEB GPD (eebgpd), and directly to the student. The major advisor is also expected to have a more in depth one-on-one with the graduate examinee to discuss the student's performance on the written and/or oral portion of the exam when needed or if requested by the student. IDPs are typically not discussed at this meeting.

(4) Year 3: Qualifying Examination Part 2, 'Research Skills'

(A) Format:

- (i). *Written format*: The student submits to the Advisor and Committee a written report on preliminary research and a written proposal for their dissertation research. There are no set formats for the write up of preliminary research and proposal. Students should consult their Advisor and Committee and look at previous proposals.
- 2. *Oral Examination:* An oral examination covering both the report on the preliminary research and the proposal is held before the end of the sixth week of the sixth semester. This chronology allows time for a retake before the departmental deadline (end of the student's sixth semester) if the first attempt is unsatisfactory.
- 3. *A (rarely used) option for students with a MS degree:* Students who previously have completed a Master's thesis (or other substantial graduate individual research project with a written report) may propose that this previous research and the thesis or report be accepted in lieu of the preliminary research project component of the qualifying examination. The appropriateness of such a substitution will be determined by the student's Advisory Committee. If the substitution is accepted, both parts of the qualifying examination must be completed prior to the 13th week of the student's fourth semester.

(B) Reporting:

Please follow the guidance for the Qualifying Exam part 1. However, students should complete and distribute the IDP before this exam, and it should be discussed at the end, before the advisor-free period.

(5) Post Qualifying Exams: What is next? Years 3 and beyond

(A) Admission to Candidacy:

Once the student has:

- 1. passed both parts of the qualifying examination and
- 2. completed all required major coursework (including 2 credits of Brown Bag), minor course work, and a three+ credit statistics course,

the student can be nominated to candidacy for the Ph.D. degree. In order to advance to candidacy the student must submit via <u>Nomination of Candidacy Form</u>. A list of courses used for the degree must also be submitted (including semester and year taken, credit value, and grades) that indicates which are major and minor courses and which fulfill Areas of Specialization. (Use of the EEB Checklist will make that task easier.)

(B) Official Nomination of the Research Committee:

Typically, most students submit the Nomination of Research Committee (NOR) form when they submit the

Nomination of Candidacy from. It must be submitted no later than by spring semester of 4th year. When submitting the NOR form, the candidate must include a one- or two-page prospectus of the dissertation research to the Graduate School, after consultation with and approval by the student's Advisor and by the proposed Research Committee. After completing the NOR form, any subsequent changes to the composition of the Research Committee should be completed via the <u>PhD Research Committee Change</u> form.

(C) Citizenship in EEB:

Even after completing coursework and Qualifying Exams, it remains important to contribute to our EEB community.

1. *Brown Bag requirement*: Students are required to deliver at least one seminar in the L570 'EEB Brown Bag' (formally 'Seminar in Ecology and Evolutionary Biology'). (EEB encourages that students deliver more than one during their grad career).

2. *Expectation of attendance*: Students are expected to attend EEB Brown Bag (typically Tuesdays) and EEB Seminar (typically Fridays), from first year through end of graduate school.

3. *Encouragement of participation*: Students are encouraged to attend more informal forums for interactions. In the past these have included: Ecolunch, EDG (Evolution Discussion Group), Behavior and Physiology Journal Club (SMURLAS), Disease Ecology and Evolution Discussion group (DEED), etc. These forums provide opportunities for interactions, presentation of research, discussion of primary literature and books, etc. Many other opportunities exist to participate in other departmental functions: the Holland SSRP and Rise Programs, Groups Scholars program, STEM and Science Olympiad, etc.

Schedules for EEB Friday seminar, Brown Bag, journal clubs, etc., can be found online and in TWIB (This Week in Biology) mailings.

(D) Requirement for continuous enrollment:

After admission to candidacy the student must enroll each semester, excluding summer sessions, for any remaining required course work, dissertation, or research credit. If 90 hours have been completed, the student has been admitted to candidacy, and if the student is supported by the University (i.e., they have not graduated), they will register for 6 credits of G901 for up to six semesters, as needed. After that, the student must enroll for at least one hour of research or dissertation credit in *each* semester until the degree is completed (even if the student lives outside of Bloomington). A candidate who will graduate in June, July, or August must enroll for at least one hour of credit in either of the two summer sessions (see also finishing FAQ document in the 'EEB Grad Docs' folder).

(E) Requirement for service as an Associate Instructor (at least one semester):

If the student has not served as an Associate Instructor (AI) at least once pre-candidacy, he/she must serve at least once during the Candidacy period. (Every student must serve at least once at IUB; service as the 'instructor of record' for a class would certainly fulfill this requirement).

(F) Requirement for written evaluation following Annual Committee meetings:

As described in the <u>committee meetings document</u>, each student must hold at least one meeting annually with their Advisory/Research Committee. IDPs (and CVs) should be distributed beforehand; advisor-free time should conclude the meeting. Advisors should fill out the Committee meeting form after the meeting, sending it to the Grad Advisor and EEB GPD and archiving it in the student's individual folder. The committee meeting report should establish that the student continues to make 'satisfactory' progress, as

determined by the Committee. Holding the meeting annually and demonstrating 'satisfactory' progress enable the student to remain in 'good standing' with the program. (See the <u>document</u> for more information and detail).

(6) Dissertation Defense

EEB students should consult the <u>Frequently Asked Questions</u> for finishing (posted in the 'EEB Grad Docs' folder). Several items below are discussed there, too.

(A) 'Penultimate' committee meeting:

Students should hold a 'penultimate' committee meeting with their committee approximately 6 months (typically 4-8 months) before the intended date to defend the dissertation. At this meeting, the students present the core elements of their dissertation chapters, already completed and in final prep. The committee then provides feedback on the material presented. They will indicate whether they can forecast a successful defense or if instead they recommend a delay in defense timing. No decisions made at this meeting are binding, however. This penultimate meeting may fulfill the requirement for an annual meeting, or it may be an additional meeting during an academic year (depending on the timing of meetings).

(B) Submitting and defending the dissertation:

To obtain the Ph.D., a candidate must submit a dissertation that is acceptable to the members of her/his/their Research Committee and to the University Graduate School. Research for the dissertation usually occupies substantially more than half the student's graduate training. It is essential that the student obtain the Committee's advice and consent in formulating, pursuing, and writing the dissertation.

If the dissertation topic is subsequently changed significantly following submission of the Nomination of Research Committee (NOR) form, approval must be obtained from the Research Committee and, if the nomination to candidacy has been submitted, from the Dean of the Graduate School.

The specific deadlines are / process is:

(1) Announcement with the UGS:

A final and approved the same time, the student must submit to the Graduate School a one-page <u>announcement</u> of the final public examination via one.iu.edu, called '<u>Ph.D. Defense Announcement</u>'. The final approved form must be submitted to UGS 30 days prior to the defense. Therefore, it should be submitted electronically to committee members <u>40 days</u> in advance. (<u>Deadlines</u> from UGS).

(2) Submission of to the committee:

<u>At least two weeks¹</u> before the final examination, an electronic version of the dissertation must be submitted to each member of the candidate's Committee. (Some committee members may request a paper copy). Your committee may or may not require formatting by the guidelines set by the Graduate School for this submission to them.

(3) Defense:

The student must defend her/his/their Ph.D. dissertation. First, the dissertation is presented in a public

¹ The UGS typically requires 30 days. However, within EEB, two weeks is a realistic norm acceptable to most Research Committees. The specifics of this timing should be negotiated between students, Advisors, and Research Committees.

seminar followed by open discussion (question-answer session). A meeting with the Research Committee will follow. The committee will determine the outcome: *pass, conditional pass, deferred decision, fail.*

(4) Filing the dissertation:

Specific guidelines for the <u>preparation (formatting)</u> and <u>submission</u> of dissertation are expected by UGS. A pdf copy of your final dissertation must also be submitted to the Graduate Office of the Department of Biology. At the time of the defense "R" or deferred graded research credits are turned to letter grades.

(5) Off-campus committee members:

Per UGS Policy, all members of a PhD student's research committee are expected to participate in the student's defense in-person and on-campus with the student. If there are ever cases where a member is unable to participate in-person and on-campus with the student, the EEB GPD and/or the committee member must send the Doctoral Recorder (presently Shelly Gerber-Sparks, <u>gerbers@iu.edu</u>) and email explaining how he or she will participate in the defense off site and why he or she is unable to participate in person. UGS needs to track and record these off-site events for defenses.

Additionally: If a member is off campus they must still sign both the abstract page and the acceptance page (it has to be an original signature). So, if they are off campus you will need to send the pages to them via attachment, have the sign it and then fed ex (UPS, etc.) the pages to you. To date, UGS still does not allow electronic signatures.

(C) Time Limits, Extensions, and Revalidation:

(1) *Time limit and Termination*: The student must submit and have received acceptance of her/his/their dissertation within **seven years** after the date on which the qualifying examination part 2 is passed. Failure of a candidate to meet this requirement will result in the dismissal both of candidacy and of enrollment in the degree program.

(2) *Reinstatement:* To be reinstated in the Graduate School after dismissal in (1), the student must first take and pass a then-current Ph.D. qualifying examination and then petition for a reinstatement of candidacy which, if granted, will be valid for a period of three years. If at the end of the period of reinstatement the student has a dissertation accepted for defense by the Research Committee, but needs additional time for the defense, etc., the Graduate School may grant an extension of up to six weeks. However, no other extensions will be approved. (Please see the UGS Bulletin for more details).

(3) *Revalidation:* In addition, all course work that is to be counted toward the Ph.D. must have been completed or revalidated within seven years prior to the completion of the degree. Courses that were taken more than seven years prior to completion may be revalidated (ask the Biology Grad Office for help with routing the eDoc, if necessary). The purpose of revalidation is to demonstrate that courses counted toward a degree (and the body of knowledge contained in them) are acceptable as current and adequate at the time of revalidation. For *each course* falling outside the seven-year period allowed for the Ph.D., students must demonstrate that they have remained current in the knowledge required by the course. This can normally be done by:

-passing an examination specifically on the material covered by the course;

-passing a more advanced course in the same subject area;

-passing a comprehensive examination (either an M.S. exam or a Ph.D. qualifying exam) in which the student demonstrates substantial knowledge of the content of the course;

-teaching a comparable course; or

-publishing scholarly research demonstrating substantial knowledge of the content and fundamental

principles of the course.

Please consult the latest version of the UGS Graduate Bulletin for more details on each of these, (1)-(3).

(7) A Minor in EEB (for Students Outside EEB)

Students from outside of EEB are welcome to pursue a PhD minor in EEB. EEB's minor requires (as summarized in the latest entry in the UGS Graduate Bulletin):

(1) *Minor advisor*: Students must select an EEB Minor Advisor from a list of Core or Affiliate EEB Faculty (see EEB Training Faculty page on the Biology Dept website).

(2) Number of credits required: 6 credits.

(3) *Course offerings*: Select 2+ courses from one of the three areas of concentration in Box 1 (above). Please note:

- * Courses may not satisfy major and minor requirements simultaneously.
- * Courses from more than one area of concentration may be approved by the minor advisor.
- * Substitutions may be approved by the EEB Minor Advisor and the EEB GPD.
- (4) Grades: An overall average of a B (3.0) is required in EEB minor coursework.

(5) *Transferring Credit*: A student may transfer grad courses to meet requirements of the EEB Minor. This transfer must be approved by the students' Advisory Committee and the Minor Advisor.

Students wishing to receive an EEB minor should complete the EEB Minor Application form. Minor advisors, the Graduate Office, or the EEB GPD can provide this form on request, since non-EEB students cannot access the 'EEB Grad Docs' folder.

Table 1. Summary of key deadlines and tasks for the EEB PhD Program (with key links). Students should use the EEB Checklist ('EEB Grad Docs' folder) to track their progress on these tasks.

1. Meeting with Advisor1stBy 6-8 weeks into first semester2. Formation of advisor-mentor relationship, joining a lab1stFirst or Second Semester - by May at the latest3. Annual Individual Development Plan (IDP)AllAt least two weeks before annual Advisory Committee meeting (each year)4. Advisory Committee, submission of Advisory Form to Graduate Office1stBy end of Spring Semester5. Formation of Advisory Committee, submission of Advisory Form to Graduate Office2ndBy 13th week, spring semester; advisor fills out committee report form7. Qualifying Exam, Part 1: 'Breadth of Knowledge'2ndBy end of spring semester; advisor fills out committee report form8. Completion of coursework for EEB major etc., including 2 semester of EEB Brown Bag, 2 courses in one area of concentration, 1 course in another (Box 2), and fulfillment of a minor (Box 3)Syring at the latest, but preferably after candidacy in third year; fill out NOR form10. Change of Research Committeeby 4+Spring at the latest, but preferably after candidacy in third year; fill out NOR form11. Annual Committee meetings4+This is a requirement to remain in good standing with EEB. Advisors fill out a committee report form.12. Attendance at EEB Seminar, Brown Bag, etc.AllThis is expected each week13. Continuous enrollment after candidacy3+Required 12 credits vatable (6 cr/sem) after yoars 4+; G901 credits vatable (6 cr/sem) after yoars 4+; G901 credits vatable (6 cr/sem) after yoars 4+; G901 credits available (6 cr/sem) after yoars 4+; G901 credits available (6 cr/sem) after yoars 4+; G901 credits available (6 cr/sem) aft
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16 Penultimate Committee meeting ¹ A-6 Held c. 6 months before intended defense. May
serve as annual committee meeting or may be an
additional meeting. A dyisor must fill out
committee report for it
17 Defense: approval 30 days before defense via
Ph D. Defense. Announcement' form. Submit it to
committee members 40 days before defense
18 Defense: submission of dissertation ¹ 4-6 At least two weeks before the defense, in PDF
and/or printed format: must be defended no later
than 7 years post completion of Qualifying Exam
Part 2
19. Defense: filing of dissertation ¹ 4-6 Please note deadlines to graduate within certain
semesters (e σ 15 July for summer graduation).
heed formatting guidelines set by UGS

¹Students planning to finish and preparing to file must consult some frequently asked questions (FAQ doc in 'EEB Grad Docs' folder).

II. M.S. IN EVOLUTION, ECOLOGY AND BEHAVIOR

Many elements of the EEB MS program resemble those of the PhD program. Below, the key similarities and differences are highlighted. Additionally, instructions for transferring from the PhD to the MS, and from the MS to the PhD, are provided.

(1) Description of MS program in EEB

(A) Advisor and Advisory Committee:

Advisor: The student must obtain the agreement of a faculty member in the Department of Biology to serve as the student's Research Advisor.

Advisory Committee (UGS policy): The M.S. Advisory Committee must include three faculty (TT or RS) members at IUB (but more, including from non-IUB institutions, are acceptable). The chair should be graduate faculty and Core/Affiliate with EEB, but it may include one or more additional faculty members from any department at Indiana University. An Advisory Committee for the Ph.D. in EEB can also function as the Advisory Committee for an M.S. in EEB.

In practice, the Advisory Committee usually is chosen by mutual agreement between the Advisor and the student, who then contact potential committee members and obtains their agreement to serve on the Committee. A nominating form (from the Biology Graduate Office) designating the proposed membership of the Committee is submitted to the EEB Program Director, the Director of Graduate Studies of the Biology Department, and the Graduate School for approval.

(B) Course requirements:

The Advisory Committee must meet before the end of the student's second semester of M.S. work and approve a proposed plan of course work and a proposed topic and scope for the thesis or alternative project. The nature of these two components is determined by the student's Advisory Committee subject to the following constraints:

(i) *Graduate Credits*. A total of 30 credit hours, of which at least 20 credit hours must be taken in approved evolution, ecology, and behavior (or related) courses. The courses must have a coherent focus within the general field of ecology, evolutionary biology, and behavior. Examples of appropriate foci are the Ph.D. areas of specialization (Box 1 above). These courses must be approved by the student's advisory committee. The remaining credits (up to 30) should be L800 Research (or equivalent).

(C) Grade Average and Time Limits:

(i) *Grade averages*: A cumulative "B" average (3.0) is required by UGS for the degree, but any support from Biology (if offered and available) requires a cumulative 3.2 GPA. If a student's average falls below 3.0 GPA, the student will be placed on academic probation by UGS. Failure to raise the overall average to at least 3.0 during the next semester will result in dismissal from Graduate School.

(ii) Time Limits:

<u>Students entering the MS program directly</u>: M.S students are guaranteed only five semesters of support of full-time study assuming continuous enrollment. Enrollment is not required during the thesis-only phase of study. If enrollment is part-time or episodic, students must complete the degree in five calendar years More specifically, all coursework submitted with the thesis for degree completion must have been completed

within 5 calendar years, or those courses must become revalidated following UGS policy – see section 6(C)(3) above).

<u>PhD to MS transfers</u>: Students in Ph.D. Programs in the Department of Biology who decide to leave IU during or after the fifth semester may petition the EEB Program Director *and* the Director of Graduate Studies for a single additional semester of support to complete the M.S. Such petitions will be considered on their individual merits. *See Box 4 for more details*. Please note: All coursework submitted with the MS thesis for degree completion must have been completed within five calendar years, or those courses must become revalidated with UGS.

(D) Thesis or Alternative Project:

The M.S. in EEB must include a research project following the guidelines below:

(i) Proposal:

Before the research is begun, the student must obtain the approval by her/his/this Advisory Committee of a written proposal for the M.S. research project. The brief proposal should include a statement of the research problem, a brief analysis of the most relevant literature, a tentative experimental design, and a plan for the data analysis. The scope of the project should be such that the project could reasonably be completed in no more than nine credit hours of effort.

(ii) Conducting the research:

Once the design is agreed upon by the student and the Committee, the student proceeds with the research, making necessary design modifications in consultation with her/his/their Committee. Continuous enrollment is not required while conducting MS thesis research (in contrast to the PhD).

(iii) Thesis and Oral Defense:

After the research is completed, a written report is prepared that usually includes revised material from the original proposal as well as *properly analyzed* results and discussion. The research project must be orally defended before the Advisory Committee. The initial part of this defense may be a public seminar. It is not necessary that the results of the research adequately support or refute the initial hypothesis.

(iv) Evaluation:

Rather, the examination and written report will be evaluated on the student's mastery of the skills of problem delineation, research design, research techniques, data analysis, elucidation of the significance of results, and written and oral presentation.

(v) Use of Thesis Project for PhD Transfer:

Students who plan to pursue the Ph.D. in EEB may request permission to use the preliminary research project component of their qualifying examinations as the M.S. project and examination.

(vi) Scope of the Project:

The scope (6-9 credit hours) and the relative success of the research will vary among projects. More extensive projects producing positive, publishable results will usually be designated '<u>theses'</u>. Briefer projects and those producing primarily negative results will be designated '<u>alternative projects</u>'. Students completing a thesis should consult the Graduate School Bulletin for information on format, number of copies, etc. (Current directions from UGS – <u>deadlines</u>, <u>submission</u>, <u>formatting</u>).

(E) Certification:

Satisfactory completion of the program of coursework, the thesis or alternative project, and the M.S. degree as a whole must be certified by the Advisory Committee on the appropriate form. Subsequent approvals by the Director of the Graduate Program in EEB, the Director of Graduate Studies of the Department, and the

2. Departmental Transfer Policy: MS to PhD or PhD to MS

(A) Master's to Ph.D.: Overview:

Admission directly to the Master's program is rare for EEB. The Master's degree program is not meant as a probationary period for evaluating borderline Ph.D. students before admitting them to the Ph.D. program. Students are eligible for five semesters of AI support.

Master's students sometimes change from the Master's program to the Ph.D. These students must formally apply to the relevant Ph.D. program through the normal application process no later than their third semester of MS study. The applications will be reviewed in winter along with all other applications to the Ph.D. program using the same criteria used when considering applicants who have been in Master's programs elsewhere.

(B) Ph.D to Master's: Overview and specific procedures:

For various reasons, student may change from the Ph.D. to the Master's program. For example, students may come to realize that they would prefer to follow a different career path. Some students may be confronted with issues in their personal lives that may make it difficult to continue studies. Faculty may also recommend that a student transfer to the Master's program if they are not making sufficient progress to complete the Ph.D. in a timely fashion.

To change from the Ph.D. to the Master's program, a student must be on track to complete the necessary course requirements (20+ course credits) and to complete sufficient research (credits of L800 up to 30) for a Master's Thesis.

The procedures and form for changing from the Ph.D. to Master's degree are found in **Box 4**. Note that since the students have already been admitted to graduate program, the decision to change the degree program is approved by the EEB GPD in consultation with the DGS.

III. MISCELLANY

(1) Flexibility in degree requirements:

The requirements for the M.S. and Ph.D. degrees outlined above may be modified in several ways to take account of the student's background and career objectives. Any required course may be waived upon presentation of adequate evidence showing that the student already has acquired substantially the same knowledge either from previous courses or independently. Students may petition for a modification or waiver of requirements that seem inappropriate in their particular case (there is a guide from UGS to submit the eDoc). Such petitions must have the approval of the student's Faculty Advisor and Committee. Petitions must be approved by the Director of the EEB graduate program and by the higher unit, if any, responsible for the particular requirement (often, the DGS or the UGS).

(2) Alternative career objectives: Students are encouraged to consider courses or training beyond the formal requirements of the programs described here as possible preparation for careers in areas outside traditional academia. Students may wish to elect courses in such areas as computer science or information technology, technical writing, applied ecology, etc. It is possible in some instances for a student to complete the M.S. in Environmental Science (MSES) degree in the School of Public and Environmental Affairs (see

above) while satisfying the requirements for the Ph.D. in EEB. Research in applied areas of biology may be proposed for the Ph.D. or M.A. degree. Other alternatives may be available to students who have interests in mathematics, programming and data analysis, or geology.

Box 4: Procedure for transfer from Ph.D. to Master's degree in the Department of Biology

Since Ph.D. students were admitted to the program with the understanding that they will complete Ph.D. research, changing to the Master's degree requires appropriate approval. To request admission to the Master's degree from the Ph.D., please complete the following steps.

(1) *Eligibility and Lab:* To be eligible to transfer to the Master's, it is imperative that you have completed the necessary course work and have identified an advisor and two faculty members who will serve on your advisory committee.

(A) <u>Switching labs?</u> If you plan to change to a different lab than the one in which you conducted your Ph.D. research, you need to submit a detailed proposal and justification for the change.

(B) <u>Committee membership</u>: Biology requires three committee members to serve on a Master's committee. Membership, however, is not regulated or monitored by UGS or CGO. Rather, it is internally tracked. Hence, committee membership can change without filling out administrative forms with UGS or GGO. Three members, including the committee chair, just sign the 'acceptance page' for UGS upon filing the thesis (directions).

(C) <u>Validity of courses</u>: Courses are valid for 5 years for those in a MS program. That means that courses submitted for completion of the MS degree with the thesis must have been completed within five calendar years.

(2) *Form*: Complete a "Request to Transfer from Ph.D. to Master's degree Form" that is signed by you, your thesis advisor, and members of your thesis committee (available in 'EEB Grad Docs' folder). Submit the form to the Advisor for Graduate Affairs, the EEB GPD, and the DGS.

(3) *Request Letter*: Submit a letter (electronic is acceptable) to the Director of Graduate Studies copying the Advisor for Graduate Affairs and the EEB GPD.

Details:

- The letter should describe the reasons for requesting the change from PhD to MS.

- If you plan to change labs and/or your advisor, include a justification.

- Include a brief project proposal including expected date of completion.

- Before submitting this letter, you should discuss the proposed research plan and its timing with your committee, at the very least with your advisor.

(4) *Letter from Advisor*: Your future Master's thesis advisor must also submit a letter (electronic is acceptable) to the Director of Graduate Studies, the Director of the EEB Graduate Program, and the Graduate Advisor. In that letter, he/she indicates that (A) they will serve as the Master's advisor, (B) the student will stay in his/her/their lab until completion the degree, and (C) current progress is consistent with the expected date of completion. The letter should be cc'd to the Advisor for Graduate Affairs.

Next steps:

Approval: The DGS and the EEB GPD will review the request. If the request is granted, the student will meet with the EEB GPD to verify progress towards fulfillment of credit requirements. If the request to transfer is approved, the Grad Advisor will inform the College of Arts and Science that the degree goal has changed. If the request is not approved, the student will not be allowed to continue in the graduate program.

Support: The DGS will lay out the specifics of future support in the department as a MS student. Support will be granted solely on the availability of AIships unless the advisor will offer support on a grant (as an RA). *Support is not guaranteed*. The student must consult the Advisor for Graduate Affairs regarding the availability of AI positions by Oct 1 for Spring classes or by Feb 15 for Summer and Fall classes.

APPENDICES – MISCELLANEOUS POLICIES

(1) QUESTION: What happens to your research committee when your advisor (research chair) or committee member moves to a new University or changes their IU status?

According to University Graduate School (UGS):

Former IU Graduate Faculty members are allowed to continue to serve in their prior roles (committee members, chairs) for one year after their appointment has been terminated. After that time they may continue to serve as outside (non-IU) members, but cannot be counted in the requisite minimum 4 IU Graduate Faculty (2 of whom must be endorsed) to comprise a PhD dissertation committee. In addition, beyond one year, a former committee chair may serve in this role as a co-chair with a currently endorsed member of the IU Graduate Faculty.

If your advisor (research chair) moves:

(A) If you will defend within one year of your advisor leaving:

- 1. Your advisor can remain your advisor, without a co-advisor, for one year.
- 2. You do not need to add a fifth committee member.
- 3. Your advisor does not need an appointment at IU. Very often in Biology, your advisor's affiliation with section does not change until their last student has graduated.
- 4. The off-campus advisor must be present on-campus for the defense. If you have moved with your advisor, you must also be present on-campus for the defense. This is consistent with the IU rule that all candidates for the PhD must be present in person for the defense.
- 5. You should have already filled out the 'Nomination of Research Committee' (NORC) form. If you have not done that, fill it out before your advisor leaves.

Note: previously there was some talk about the advisor having a "courtesy appointment" but that is not needed.

(B) If you will defend after your advisor has been/will be gone for one year:

- 1. Your advisor will officially become your outside committee member (a non-IU graduate faculty on the committee) who is also acting as a co-Chair. Anyone can have external members be co-Chairs or committee members at any time. Because you need an IU faculty member to be Chair or co-Chair of your thesis committee, you now must find a local co-Chair. This is usually a current committee member.
- 2. You must add a local member, as your off-campus advisor becomes a fifth rather than a fourth member, to maintain the requirement of having 4 IU graduate faculty on your committee.
- 3. Your off-campus (co-) advisor can attend the defense remotely provided that the on-campus coadvisor is present. However, prior permission must be secured from UGS.
- 4. You must fill out the 'Change of Research Committee' (CORC) form, routed through your advisor, naming your co-advisor.

If a committee member moves

A departed committee member can remain a fourth member for one year. After that time, the departed committee member becomes a fifth member if retained. A fourth, local member must be recruited, and a CORC form must be completed if the NORC has been submitted.

If your advisor/committee member becomes Emeritus

According to the UGS, the faculty member Emeritus can still remain as your Chair or on the committee. In Biology, we have traditionally let Emeritus professors remain as Chair of the research committee. It is up to each Department to decide what an Emeritus professor can do in this situation.