

*Appendix B: Written qualifying examination procedures for the PhD Degree of Evolution, Ecology, and Organismal Biology*

**WRITTEN QUALIFYING EXAM PROCEDURE  
EVOLUTIONARY BIOLOGY PhD TRACK**

The purpose of the Written Qualifying Examination is to determine whether students have enough background knowledge and understanding of evolutionary biology to prepare a meaningful and feasible dissertation. To that end, students are required to prepare a Review Paper in the intended topic of the dissertation. This paper will contain the conceptual framework for the work, placing it in an appropriate and broad background in evolutionary biology as a whole. The intended audience is scientists in all fields of evolutionary biology, as will be the case for many grant proposals, so it is particularly important to make the significance of the issues addressed clear. The paper is not merely a summary of papers, but a focused synthesis and critical review of the accomplishments in the area that emphasizes the unanswered questions and thus defines the area of dissertation research.

The review paper has a maximum length of 4500 words, excluding tables, figures, and citations. It shall be prepared in Times Roman 12pt font (or the equivalent in size and clarity), double-spaced, left-justified, with 1" margins all around. Regardless, no more text than 15 pages double-spaced. Give citations in the text by name and date (not by number).

The writing of the paper should be in the hands of the student alone, **without benefit of editing by faculty or others**. However, it is understood that the development of students' ideas up to the point of writing the paper involves written and oral give-and-take with faculty and other students, which is encouraged.

The Review Paper will be more than a summary of the literature in a given field, although it is expected that the major papers and books in an area will be used to write the paper. Emphasizing the historical development of the ideas, the paper should focus on the conceptual framework of the topic, and conclude with a discussion of the remaining issues in the field. The paper should explicitly answer the following questions:

1. What are the big questions in the area of interest?
2. How have they been approached previously?
3. What is needed now to advance our understanding in this area?

These questions may form sections of the paper, but this is not necessary. Note that this paper is **not** a research proposal. Nevertheless, you are encouraged to include up to one page describing your research and how it will contribute to the broader area in evolutionary biology that you have chosen to review. Examples of good review papers may be found in recent issues of *Annual Reviews* (various topic areas) or *Quarterly Review of Biology*.

Submitted papers will be circulated to the faculty of the Evolutionary Biology Track, who will evaluate them. If a paper shows that a student is ready to proceed in developing the dissertation proposal, then the student will be encouraged to prepare for the Oral Qualifying Examination. Alternatively, if there are serious flaws in the paper, the faculty may decide either to allow one resubmission, or not to allow resubmission.

Papers are due no later than the end of week 8 of the spring quarter of the second year in the Ph.D. program. Resubmissions will be required by the beginning of the winter quarter of the third year.

## WRITTEN QUALIFYING EXAM PROCEDURE ECOLOGY PhD TRACK

The purpose of the Written Qualifying Examination is to determine whether students have enough background knowledge and understanding of ecology to prepare a meaningful and feasible dissertation. To that end, students are required to prepare a Review Paper in the intended topic of the dissertation. This paper will contain the conceptual framework for the work, placing it in an appropriate and broad background in ecology as a whole. The intended audience is scientists in all fields of ecology, as will be the case for many grant proposals, so it is particularly important to make the significance of the questions being asked clear. The paper is not merely a summary of papers, but a focused synthesis and critical review of the accomplishments in the area that emphasizes the unanswered questions and thus defines the area of dissertation research.

The review paper has a maximum length of 4500 words excluding tables, figures, and citations. It shall be prepared in Times Roman 12pt font (or the equivalent in size and clarity), double-spaced, left-justified, with 1" margins all around. Regardless, no more text than 15 pages double-spaced. Give citations in the text by name and date (not by number).

The writing of the paper should be in the hands of the student alone, **without benefit of editing by faculty or others.** However, it is understood that the development of students' ideas up to the point of writing the paper involves written and oral give-and-take with faculty and other students, which is encouraged.

The Review Paper will be more than a summary of the literature in a given field, although it is expected that the major papers and books in an area will be used to write the paper. Emphasizing the historical development of the ideas, the paper should focus on the conceptual framework of the topic, and conclude with a discussion of the research questions that will comprise the dissertation. The paper should explicitly answer the following questions:

1. What are the big questions in the area of interest?
2. How have they been approached previously?
3. What is needed now to advance our understanding in this area?
4. How will the proposed work address this need?

Note that the paper should not dwell on methodology; this is not a proposal to a granting agency already familiar with the issues. Similarly, there is no need to discuss the structure of the dissertation. If the student has done preliminary research, this is all to the good, but the focus of the paper is not on the details of how the research will be performed but on why the questions to be asked are important and interesting, and their intellectual and conceptual context.

Submitted papers will be circulated to the faculty of the Ecology Track, with individual faculty members leading discussion of each paper and summarizing the group evaluation

in writing for the students. If a paper shows that a student is ready to proceed in developing a more specific research plan, then the student will be encouraged to prepare for the Oral examination. Alternatively, if there are serious flaws in the paper, the faculty may decide either to allow one resubmission, or not to allow resubmission.

Papers are due no later than the end of week 8 of the spring quarter of the second year in the Ph.D. program. Resubmissions will be required by the beginning of the winter quarter of the third year.

The written exam will be followed by an oral exam.

## **WRITTEN QUALIFYING EXAM PROCEDURE PHYSIOLOGY AND BIOPHYSICS PhD TRACK**

The oral qualifying exam will be preceded by a written proposal, ordinarily to be written in the form of an expanded NSF Dissertation Improvement grant proposal and given to the students committee prior to the first day of the spring quarter of the 2<sup>nd</sup> year (not to be longer than 30 double spaced pages; not including figures and tables). There is also every expectation that students will submit this to NIH or NSF. The students qualifying committee as well as any other interested physiology faculty will read these proposals. Faculty in the physiology and biophysics track (other than those on the committee) are not required to read all proposals but all proposals will be available to all faculty. In any case, at least three faculty members in addition to the student's advisor should read the proposal.

Pre-proposals shall be prepared in Times Roman 12 point font (or the equivalent in size and clarity), double-spaced, not right-justified, with 1" margins all around. The length of the pre-proposal should be no more than 30 pages double-spaced, including figures and tables, but not including literature cited.

Pre-proposals and research proposals should contain the following elements:

- a. Discussion of the conceptual framework of the proposed research, emphasizing the historical development of the ideas. This framework should communicate to a general biological audience why the question(s) to be asked in the research are interesting and important, and how it (they) will contribute to progress in broader field(s).
- b. Following from the above, presentation of a plan for the PhD research project, including questions to be addressed in the research, alternative hypotheses derived from these questions, and how these hypotheses could be tested and what different possible outcomes would mean.

Faculty will evaluate the research plan using two criteria. First, is the proposed research significant, and does the plan clearly explain its relationship to other work in the field? Second, does the proposed work appear to be feasible in general terms, i.e., is there evidence that the questions posed can be addressed effectively?

All members of the Physiology and Biophysics Track will evaluate proposals. Faculty will provide comments that consist of two parts. First, they will indicate whether the pre-proposal shows that the student "is ready to start research." If so, then the student passes the Written Exam. Alternatively, if there are serious flaws in the pre-proposal, the faculty may decide either to allow one resubmission, or not to allow resubmission. Second, faculty will provide specific comments (constructive criticisms) for purposes of revising the pre-proposal to become the Research Proposal for the Oral Qualifying Exam.

The written exam will be followed by an oral exam.