



DOCTORAL OF PHILOSOPHY

*DEPARTMENT OF
BIOLOGY*

CASE
WESTERN
RESERVE
UNIVERSITY

GRADUATE DEGREE PROGRAMS IN BIOLOGY

DOCTORAL OF PHILOSOPHY

A. ORIENTATION AND GUIDANCE FOR NEW STUDENTS

Each new student must meet with the Graduate Affairs Committee (GAC) prior to registration for his/her first semester of study. The GAC will help the students to identify weaknesses in his/her background and will suggest courses for the students to take. The GAC also will inform the student of his/her responsibility to identify an area of research and to select a research advisor, and it will introduce the student to the biology faculty members.

B. THE FIRST YEAR

1. Area of Study, Research Advisor, and Advisory Committee

By the end of the first semester of study, each student is expected to have identified a major area of study and to have selected a research advisor. However, these selections are not irrevocable. The student may change his/her area of interest, advisor, or both without embarrassment to him/her or to his/her advisor. The research advisor is responsible for guiding the student in the selection of the courses and seminars appropriate for their training. The student, however, is free to, and is urged to, consult with other faculty members for aid in course selection or with his research project if he/she thinks it will be helpful. By the end of the first year of study, the student and advisor must select two additional faculty members to serve with the Advisor as an Advisory Committee for the student. The student is expected to meet at least annually with her or his Advisory Committee.

It is expected that each student will be involved in a research project during the first year in graduate school. It is the responsibility of the advisor to help their student with the project.

2. Program of Study

Within the first year of study, the student and advisor must complete a Program of Study form (available in the Biology Office) for the entire Ph.D. program and submit it to the Chair of the Biology

Graduate Affairs Committee. The anticipated program of study may be modified at any time in the program, but must conform to Graduate School requirements. Students entering with a Bachelors Degree must complete 36 credit hours of study before the Candidacy Examination (see below). No more than 6 credit hours of BIOL 601 can be used for this requirement, but students may repeat BIOL 599 if other formal course work is not appropriate for the student's degree program. Registration for BIOL 599 is by permit only (application forms are available in the Biology Office) and the grade assignment will reflect the evaluation of a paper by the student's Advisory Committee. Students entering with a Masters Degree must complete only 18 hours of formal course work before advancing to the Candidacy Examination, but are limited to 3 hours of BIOL 601.

3. Teaching Requirement

Teaching experience is a required part of the Ph.D. program. Teaching duties are assigned by the Department Chair, taking into account both the specialized areas of interest of the student and his/her broader professional development. The normal teaching requirement consists of four semesters.

C. SUMMER

Graduate students will be involved in full time research and graduate study during the summers throughout their graduate years.

D. SECOND YEAR—EVALUATION OF CANDIDATE

Evaluation is made on the basis of the student's course performance, seminar, qualifying examination, and the advisor's recommendation.

1. Coursework Requirements

Any student whose course performance is not satisfactory may be terminated. A student's scholastic performance will be considered unsatisfactory if he/she does not maintain at least a "B" average (3.0 on a 4.0 scale). In addition, any grade of "F" will result in automatic termination, as will the receipt of 6 or more credits of "C".

The student may appeal decisions made on the basis of these regulations. Such appeals shall be heard by the GAC and the student's advisor. Decisions are made by a majority vote of the GAC and the advisor.

Each student must make an oral presentation in a seminar or journal club in which he/she speaks on a topic other than that of his/her thesis research.

2. Qualifying Examinations

Formal admission to the Ph.D. program is contingent upon the student passing a qualifying examination. This examination must be completed by the end of his/her fourth semester of graduate study. Subject to the approval of the student's advisor and the GAC, the student will select two areas of biology in addition to his/her major area of interest. The student is examined in these three areas of biology.

The Examination Committee consists of the student's advisor and three additional faculty members selected by the GAC. The student's advisor should submit a list of five faculty to assist the GAC in this selection. A member of the GAC will be a non-voting chair of the Committee.

Qualifying examination consists of a paper describing a specific research proposal and an oral examination. The oral examination is composed of two parts: a defense of the research proposal and a comprehensive examination covering the three areas of biology.

a. Research Proposal

At least two months prior to the qualifying examination, the student holds a meeting with the GAC. At this meeting the student presents 3 brief abstracts on topics suitable for the research proposal for the qualifying examination. The topic may not be directly related to the student's current thesis topic. Abstracts must be submitted on the Ph.D. Candidacy Research Proposal form, which is available in the Biology Office, and must conform to its style. Following approval of the abstracts, the student then chooses one of the approved abstracts for further development in to a proposal.

At least one month prior to the qualifying examination, the student presents an outline of sufficient detail to indicate the scope of the proposal. If the examining committee approves the outline, he develops a detailed proposal consisting of the rationale, technique, specific experiments, potential conclusion, and significance of the proposed work. It is suggested that the application instructions for the body of an NIH grant be

used as a guide for the organization of this proposal. The major emphasis of the paper is to be on the proposal itself, and not on a review of the literature or other background material.

The detailed proposal must be presented to the examining committee within two months following approval of the preliminary outline. The examination is held one week after submission of the proposal. It is strongly recommended that a student register for 3 credits of BIOL 601 to allow sufficient time for preparation of the research proposal.

b. **Comprehensive Examination**

The Examination Committee (as soon after its formation as is convenient) has an informal meeting with the student to discuss the scope of the examination. The student is required to have detailed knowledge and understanding of his/her major field and an understanding of the principles, language, and problems of two other areas.

c. **Seminar**

Each student is required to present a seminar to the Department some time during the second semester (normally spring) of the second year. The seminar should focus on the topic to be covered in the student's research proposal for qualifying examination. The seminar requirement must be fulfilled before taking the qualifying examination.

A timetable for the events relating to qualifying examination might be as follows:

1. By February 15: Student meets with GAC to determine the proposal topic and to name an advisor for the preparation of the research proposal.
2. Within 1 week of the GAC meeting, the student's advisor and the GAC identify his/her examination committee.
3. March 15: Student meets with his examining committee to discuss the scope of the qualifying examination and to present his/her proposal outline to the examining committee for approval.

4. April 1: The student presents a seminar to the Department on his/her proposal topic.
5. April 15: Completed proposal is submitted to the examining committee.
6. April 23: Oral examination.

Examination Format: The examination is conducted in two sections (comprehensive examination held one day and the defense of the proposal on another day), and approximately equal time is given to each portion of the examination. Normally, the comprehensive examination is given first, so that problems that may be encountered in the review of the research proposal may not influence the student's performance on the comprehensive examination. However, the sequence may be reversed if the student or the Examining Committee wishes to do so.

d. **Examination Results**

The Examining Committee recommends one of the following courses of action:

1. Proceed toward the Ph.D. degree (with or without conditions necessary to correct deficiencies identified during the examination).
2. Re-examination on one or both portions of the examination.
3. Permission, with or without conditions, to complete a Master's degree
4. Failure

E. THIRD YEAR—ADVISORY COMMITTEE

Immediately after passing the Ph.D. qualifying examination, each student should, with the help of his/her advisor, name a thesis advisory committee. This committee should consist of 5 members including the research advisor and at least 1 examiner outside the Biology Department. The committee must be approved by the GAC. Each student should hold a meeting with his committee annually (prior to June 1) to discuss progress on his or her research. It is not required that the GAC representative be present at the annual meetings. However, the GAC should be apprised of the progress discussed at the meeting.

F. THESIS RESEARCH/SEMINAR

In the first semester of his/her third year the student should present a seminar to the Department on their thesis research. The student should, of course, discuss his/her research plans with their advisor. However, the student is urged to consult other faculty members about their research whenever appropriate. The GAC will review the progress of each student once a year.

G. FINAL YEAR—DEADLINES

Each semester the University publishes, in calendar form, its deadlines for application for degrees approval of thesis/dissertation form, and defense of the thesis/dissertation. IT IS THE STUDENT'S RESPONSIBILITY TO BE AWARE OF AND TO MEET THESE AND THE FOLLOWING DEADLINES:

- No later than one month prior to defense: Present a seminar on thesis research to the University community.
- No later than 10 days prior to defense: Submit a final copy of the thesis to the examining committee and to the Department Chair.

H. THESIS PREPARATION

Before preparing a draft of the thesis, the student should obtain all necessary style information from the Graduate Deans Office. Ultimately, the thesis must be approved for defense by the student's research advisor, but the student should seek review by other qualified readers.

I. THESIS DEFENSE

1. Paper

Each student is required to submit at least one manuscript to a respected refereed scientific journal. The paper must be on part of his/her thesis work and the student should be first author. The paper must be submitted at least 3 months prior to the thesis defense. Reviewer's comments should then be available to committee members at the defense.

2. Examining Committee

The Examining Committee, which must be approved by the GAC, shall consist of:

- A member of the GAC acting as a non-voting Chair.

- No more than five voting members, including the research advisor and at least one examiner from outside the Department (at least three members of the Committee must be faculty members in the Biology Department). If desired, the fifth examiner may come from another comparable institution (subject to Graduate School approval) as long as three of the examiners are from the Biology Department and one examiner is a CWRU faculty member in another department.

3. Thesis Seminar

Not later than one month before the thesis defense, each Ph.D. candidate is required to present a seminar based on the thesis research. The seminar is to be scheduled by the student and will be open to the entire University community.

4. Results of Defense

The thesis will be accepted if, at the examination, at least four of the five-committee members vote to accept it. If three of the five vote for acceptance, the thesis will be sent to an outside reviewer, selected by the original examining committee. The examining committee will consider the outside reviewer's report in its final review. In the final review a student's thesis is accepted if three or more members of the committee approve. In the event that the student's thesis is not accepted (fewer than three members approve), the committee shall recommend a course of action to be followed. The alternatives are: failure with no repeat of the examination; failure with re-submission and re-defense of the thesis with changes suggested by the committee. Failure to pass a second time shall be final.

