

**UNIVERSITY
OF
VIRGINIA
DEPARTMENT OF BIOLOGY**



**GRADUATE STUDENT
HANDBOOK**

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Ph.D. PROGRAM IN BIOLOGY

STUDENT ADVISING AND SUPERVISION

I. Entering Students

During the week preceding the beginning of the fall semester, entering students will participate in a departmental orientation with the Director of Graduate Studies (DGS) and the Graduate Committee. At this time, students will meet individually with the DGS and members of the Graduate Committee to review the student's preparation and interests and to formulate a program of study for the first academic year. While the DGS serves as an advisor to all graduate students, new students will also be assigned a member of the Graduate Committee to serve as their advisor during their first year, until a Major Professor is chosen. Requests for academic credit for graduate-level courses taken as part of graduate training at another institution should be made at this time. This advising process is repeated at the end of the fall semester in preparation for the spring semester.

II. The Major Professor (Ph.D. Advisor)

Each student will eventually choose one professor in the Department to serve as principal teacher and advisor for the duration of their graduate studies. The choice of Major Professor is by mutual agreement between the student and professor and is usually made at the end of the spring semester, after the student's final laboratory rotation. Either party can terminate this agreement. In such a case, both student and professor shall provide written notice to the DGS.

With the guidance of the Major Professor, the student develops a research program appropriate for a doctoral dissertation. The student with the guidance of the Major Professor completes this research program; the Major Professor and the student's Dissertation Committee oversee its progress and completion.

III. The Dissertation Committee

By the end of January of the second academic year, the student and their Major Professor choose four additional faculty of the Graduate School of Arts & Sciences (GSAS) to serve together with the Major Professor as the Dissertation Committee. At least three faculty members of the Dissertation Committee must carry appointments in the Department of Biology. One member of the Dissertation Committee must be a GSAS faculty member appointed in a department other than the Department of Biology. One member of the Dissertation Committee who is appointed in the Department of Biology, other than the Major Professor, will be designated "First Reader." In consultation with the Graduate Committee, the DGS approves the composition of each Dissertation Committee at the time the Dissertation Committee is assembled and when changes in the composition of the Dissertation Committee are requested.

The First Reader serves as the chairperson of the Dissertation Committee, and chairs the Qualifying Examination and Dissertation Defense. The First Reader is also one of the two readers who review the Dissertation Proposal prior to its submission to the Dissertation Committee, in advance of the Qualifying Examination.

The Dissertation Committee also serves as the Examination Committee for the qualifying examination and dissertation defense. It also serves as an advisory body to the student during the tenure of her/his graduate studies and meets annually with the student.

ACADEMIC REQUIREMENTS

The Graduate School of Arts and Sciences (GSAS) requires the completion of no less than 72 hours of graduate credit of which no more than 18 hours may be Non-Topical Research. These credit hours include First Year Courses, 20 credits of graded lecture and laboratory courses, and variable hours of colloquia, seminars, and research courses, as explained below. The Department expects that 54 credits (all credits other than the 18 Non-Topical Research) will be completed by the end of second year of study. After this time, students usually

register for 12 credit hours of non-topical (i.e. dissertation) research and audit any remaining courses. Full-time graduate students are required to carry at least twelve credit hours each semester. The GSAS requires that students maintain a Grade Point Average of at least 3.0 each academic year to be considered as making satisfactory progress toward a degree. A grade of B- is the lowest satisfactory grade for graduate credit.

I. First Year Courses

Each first year student is required to register for BIOL8250 "Scientific Presentations & Writing" and BIOL8270 "First Year Introduction to Research" or their current equivalent. The purpose of these courses is to introduce new students to scientific communication, the general research areas of the department, and to introduce the students to the faculty. BIOL8250 exists in particular to help students with the oral presentation of their rotation research (see "Laboratory Rotations" below).

Each first year student is also required to complete a 1.0 credit course in Research Ethics (BIMS 7100). This course is usually given during the spring semester.

II. First Year Laboratory Rotations

All first year Ph.D. candidates must complete two laboratory rotations, generally during the fall and spring semesters. These lab rotations are to be taken as the graded, 4.0 credit courses BIOLOGY 9910 and 9920, Introduction to Laboratory Research. At the completion of each rotation, each student will make a short presentation to the department as part of a Rotation Research Mini-Symposium, organized in the fall semester by the BIOL8250 instructor and in the spring semester by a member of the Graduate Committee.

A student has the option to complete a third rotation during the summer of their first year. Although summer research courses are taken on an ungraded (S/U) basis, students will still receive a letter grade from their rotation advisors as part of the written rotation evaluation. These grades, together with the evaluation, become part of the students' records and are considered to be equivalent to formally assigned letter grades.

Students who transfer to the Ph.D. program from the M.S. program after their first year, or who enter the Ph.D. program after completing the M.S. in this department, will not be required to complete the rotations. Students who have completed an M.S. at another institution are required to complete one rotation during their first semester in the Department.

III. Formal Course Work

Of the 54 credit hours exclusive of Non-Topical Research required by the Graduate School, a minimum of 20 credit hours must be taken in graduate level lecture and laboratory courses. Credit for up to 8 hours of graduate level course work taken after completion of the undergraduate degree at this or other institutions may be granted upon successful petition to the Graduate Committee. Regardless of the area of research interest and specialization, each graduate student is urged to seek a broad background in the biological sciences by a selection of diverse courses.

IV. Colloquia, Seminar, and Topical Research Courses

After completing the above First Year, Rotation, and Formal Coursework requirements, the remaining credits to fulfill the 54 GSAS credit requirement are completed with Colloquia, Seminar, and/or Topical Research (BIOL 9995) courses.

V. Other Courses or Training

Besides the formal course work listed above, additional courses or training may be recommended or required by the student's Major Professor or Dissertation Committee. In particular, proficiency in computer science, in statistics, or in other specialized areas, may be set as additional requirements by the Dissertation Committee.

The Major Professor or Dissertation Committee may also recommend or require that a student participate in course work or independent study at a field station or at another institution. In special situations, for example, when a student holds a traineeship in an interdepartmental training program, additional requirements may be imposed,

such as enrollment in specified courses and participation in seminars and colloquia.

VI. Non-Topical Research

After completion of the 54 GSAS credit requirement, students register for 12 credits of Non-Topical Research (BIOL 9999) under their faculty advisor thus completing the GSAS 72 credit hour requirement.

OTHER REQUIREMENTS

I. Teaching

Every graduate student is required to complete a minimum of one full-time, semester-long Teaching Assistantship (TA) at some time during their graduate training. A student with previous teaching experience or with an external award that precludes teaching at anytime during their graduate education may petition the Graduate Committee for exemption from whole or part of this requirement. Prior to each term, the Director of Graduate Studies makes the teaching assignments.

II. Teaching Assistantship Requirements and Evaluation

Because teaching assignments represent an important component of the department's academic mission, students who accept Teaching Assistantships also accept the responsibility of completing these assignments satisfactorily. Before or at the beginning of their first teaching assignment, every student must attend and satisfactorily complete the required teaching workshops sponsored by the Teaching Resource Center. Students who use English as a second language must satisfactorily complete the University's English language testing/training program to be eligible for a teaching assignment. All students must perform satisfactorily in their teaching assignment, as judged from course evaluations or reports from supervisory faculty, to maintain their Teaching Assistantship and to be eligible for future Teaching Assistantships.

III. Residency

Each student must satisfy the residency requirement and any other requirements imposed by the Graduate School of Arts and Sciences, as outlined in the Graduate Record

All requirements for the Ph.D. degree must be completed within seven years of study in the Department, unless a waiver is obtained from the Graduate School. The DGS must approve the petition for a waiver prior to its submission to the Graduate School.

STUDENT EVALUATION

I. Evaluation of Course Grades

Almost all graduate level courses are offered on a graded basis. The following set of grade symbols is used by the Graduate School: A+ (4.0), A (4.0), A- (3.7); B+ (3.3), B (3.0), B- (2.7), C (0.0). According to Graduate School regulations, a grade of B- is the lowest satisfactory grade for graduate credit. Furthermore, students must maintain a grade point average of at least 3.0 each academic year in order to be considered by the Graduate School as making satisfactory progress toward a degree. The Biology Director of Graduate Studies reviews student grades at the end of each semester.

All students should be aware that although the grade of B- is adequate for general academic credit, it is considered a marginal grade for pre-doctoral students in the Department of Biology. Thus, the grade of B-(or lower) in one or more courses, especially in the first year, will be viewed as an indicator of less than satisfactory progress in the doctoral program.

A few graduate-level courses and all graduate research courses are offered on an ungraded basis (i.e. satisfactory/unsatisfactory). The S/U grades in these courses are not computed in the student's grade point

average. A grade of U in any course is considered a failing grade.

II. First Year Evaluation

The Graduate Committee evaluates the overall performance and progress of each new student after the first year. The Committee considers 1) performance in formal course work and laboratory rotations, and 2) participation in seminars, teaching and other general academic activities of the Department. A student whose overall performance has been judged satisfactory may proceed into the second year of study. A student whose overall performance has been judged unsatisfactory will be required to do one of the following: (1) Successfully complete additional course work; (2) Pursue a program leading to the Master's degree; (3) Leave the Department.

III. Second Year Qualifying Examination

During the spring semester of the second year of study, each student must successfully complete a qualifying examination administered by his or her Dissertation Committee.

The Qualifying Examination consists of two components: a typewritten document describing the student's proposed research with experimental plan and an oral defense of the document. The written document consists of a proposal that includes the specific aims of the student's proposed research, the scientific background and significance of the proposed study, a summary of preliminary results, a detailed description of the experiments planned together with their rationale and expected outcomes, and a list of all references cited in the text. The Dissertation Proposal Guide, a detailed set of instructions describing the preparation of the proposal, will be provided to students to assist in their proposal writing and organization. Proposals must conform to all stated guidelines, including page limits, to be acceptable for review.

Because the primary purpose of the Qualifying Examination is to test the student's competence in their general area of study, a satisfactory performance requires that the student demonstrate a comprehensive and in-depth knowledge of the concepts and methodologies of the disciplines comprising the major area of research interest. The student will also be expected to demonstrate an authoritative and up-to-date grasp of the literature in their area of specialization and to be able to discuss in detail the experimental design, rationale, and methodology used in their proposed research program.

Prior to the submission of the Dissertation Proposal to the Dissertation Committee, all proposals will be evaluated first by two faculty members. One of these faculty members will be the First Reader of the Dissertation Committee, the other a member of the student's Dissertation Committee. When both reviews are completed, the student will receive a written evaluation of their proposal from the First Reader, indicating the proposal's acceptability, detailing the overall strengths and weaknesses of the research plan, and outlining any revisions that may be required for the final draft.

A student whose Dissertation Proposal is deemed acceptable will distribute a copy of their proposal to each member of their Dissertation Committee and the Graduate Program Coordinator, and then schedule an oral presentation and defense of the Dissertation Proposal with their Dissertation Committee. A minimum of two weeks must elapse between the submission of the proposal and the exam. This Qualifying Examination should occur no later than the last day of classes in the spring semester.

A student whose written proposal is deemed unsatisfactory will be given an opportunity to address the deficiencies noted by the faculty reviewers and to submit an appropriately modified proposal. If the resubmitted proposal is accepted, the student will then be allowed to proceed to the Qualifying Examination.

A student whose overall performance in the Qualifying Examination has been judged unsatisfactory will not be admitted directly to doctoral candidacy. At the discretion of the Dissertation Committee, such a student may be offered the option of reexamination within a specified period of time. If the student is not offered reexamination, or if the student's performance is judged unsatisfactory on reexamination, she/he will be directed either to pursue a program leading to the Master of Science degree or to leave the Department.

It is the responsibility of the First Reader to provide to the Graduate Program Coordinator a written summary of the outcome of the Qualifying Examination and the recommendations of the Dissertation Committee. That

report will become part of the student's permanent departmental file.

IV. Annual Progress Evaluation Beginning in the Third Year

So that the Dissertation Committee remains abreast of the student's progress, the student must complete at least one meeting every 12 months with their Dissertation Committee, beginning in the Fall term of the student's third year. This meeting is necessary to remain in good standing in the Ph.D. program. Subsequent to each meeting, the First Reader prepares a brief written report describing the Committee's appraisal of the student's progress, as well as any directions or additional requirements set for the student by the Committee. Copies of these reports are made part of the student's departmental record.

THE DISSERTATION AND ITS DEFENSE

Each student is required to complete a piece of original and significant research as part of the requirements for the doctoral degree. Upon completion of the research program, the candidate presents the written dissertation, in a form approved by the Major Professor and First Reader of the Dissertation Committee, to the Dissertation Committee for its approval.

The dissertation must be prepared in the format specified by the Graduate School of Arts and Sciences in the pamphlet entitled "Physical Standards for Preparation of Dissertations and Theses." In addition, students are encouraged to write up their research in a form suitable for publication prior to the completion of the dissertation. An acceptable form for the dissertation would be an introductory review of the literature, followed by one or more papers in publishable form, followed by a general discussion. Prior publication of the work is not only acceptable, but desirable; however, in the case of multi-authorship publications, the degree candidate should clearly indicate in the dissertation the extent and nature of their experimental contribution.

The dissertation, in a form acceptable for submission to the University, will be submitted to each faculty member of the Dissertation Committee at least two weeks prior to the defense of the dissertation. The First Reader chairs the dissertation defense, and a representative of the Dean of the Graduate School of Arts and Sciences (i.e. a faculty member from another department) must be present. Following the successful defense of their dissertation, the student should ensure that the GSAS Final Exam Form is completed and signed by all members of the Dissertation Committee; this form should be given to the Graduate Program Coordinator for signature by the Department Chair or Director of Graduate Studies. Upon acceptance of a final version of the dissertation (i.e. the version that will normally be presented to the Graduate School of Arts and Sciences) by the Dissertation Committee, a public defense of the dissertation will be scheduled. The notice to announce the public defense to the University community must be posted at least two weeks in advance of the event.

The public defense will take the form of a formal departmental seminar. Following the successful completion of the public defense, the dissertation is formally accepted, symbolized by the signing of the title page by members of the Dissertation Committee. Signature by members of the Dissertation Committee verifies that all departmental requirements for the degree of Doctor of Philosophy have been satisfied. If substantive questions about the dissertation are raised during the public defense, then the Dissertation Committee will meet in private to discuss what changes to the dissertation might be required to complete the defense successfully. This permits the candidate to complete the final formal procedures for bestowal of the degree by the Graduate School.

FINANCIAL SUPPORT

Financial support, in the form of fellowships, traineeships, Research Assistantships and Teaching Assistantships, is available to Ph.D. students as detailed below. If satisfactory progress is made, a Ph.D. candidate is assured support for five years. If there are significant mitigating circumstances, a student may apply for a longer period of support. Recommendations in such cases will be made by the DGS, subject to approval by the Department Chair.

To qualify for continued financial support, students must maintain a cumulative grade point average of 3.0 and must be in good standing in the Biology Graduate Program. In addition, eligibility for continued support through Teaching Assistantships requires satisfactory performance by the student in her/his teaching assignments.

1. All Ph.D. graduate students are assured support for five years of study, contingent on satisfactory progress in the program. Such support includes the annual stipend (set each year by the faculty) and full payment of tuition and academic year fees. Support may be provided in the form of a fellowship, traineeship, Teaching Assistantship, or a combination of these, depending on student qualifications and the availability of funds.
2. During the first year of study, Ph.D. students are supported with a twelve month award. This award can be in the form of a fellowship, a traineeship, a Research Assistantship, a Teaching Assistantship or combination of the aforementioned.
3. During the second year, Ph.D. students are generally supported in both semesters of the academic year by Teaching Assistantships, unless they have alternate support in the form of a fellowship, traineeship, or Research Assistantship.
4. Beginning in the summer of the second academic year, if a student is not supported by a traineeship or fellowship, he or she is generally supported as a Research Assistant with funds derived from the research grants of their Major Professor. Such support includes payment of the stipend and of "research" tuition and fees. In those cases where the student must enroll in course work, and thus have additional tuition costs, the difference is paid from departmental funds.
5. In the event that a Major Professor is unable or unwilling to provide a Research Assistantship, the student will be offered a Teaching Assistantship on a semester-by-semester basis (fall, spring and summer) until such time that other funding becomes available.
6. In the case where a student holds a fellowship or traineeship that provides partial payment of the stipend and/or tuition and fees, the supplement will be paid from teaching funds, with the student's teaching responsibilities being commensurate with the amount of the supplement. If, in order to hold such fellowship/traineeship, the student is restricted from assuming teaching responsibilities, the award is supplemented with departmental funds.
7. Support for students in the sixth year and above is dependent on the availability of Teaching Assistantships or of research funds from the Major Professor.
8. The potential number of years of support remaining for a student who has obtained a Master's degree, or switched from a Master's degree program to our Ph.D. program, will be determined by the Graduate Committee at the time the student enters the Ph.D. program, after evaluation of the student's status with regard to fulfillment of the requirements for the Ph.D. degree.
9. All students are encouraged to apply for extramural awards (e.g. NSF Pre-Doctoral Fellowships) to support their studies. In addition to the career building prestige provided by such awards, these awards often provide a level of stipend support greater than that offered by a Teaching or Research Assistantship. Students are encouraged to discuss the preparation of these award applications with the DGS and their Major Professor well in advance of the application deadlines. A partial listing of extramural awards for pre-doctoral students is available on the departmental webpage.
10. For students not enrolled, the department will pay the Non-Resident Enrollment Fee for one term only.

STUDENT PARTICIPATION IN DEPARTMENTAL ACTIVITIES

Satisfactory progress to degree includes the expectation that all graduate students are to attend all departmental seminars and all student and faculty research talks. Graduate students are encouraged to become energetic members of the Department of Biology by participating regularly in its various academic and social activities. Graduate student participation in the meetings of the Graduate Student and Postdoc Association (GSPA) and in the weekly lunches with visiting seminar speakers is strongly encouraged. At the discretion of the Chairperson of the Biology Department, graduate students may also invited to serve as members of departmental committees that broadly impact research and/or teaching throughout the department.

MASTER DEGREE PROGRAMS IN BIOLOGY (M.S. and M.A)

M.S. and M.A Programs

I. Student Advising

A student entering the department as a declared M.S. or M.A. degree candidate meets with the Director of Graduate Studies and one other member of the Graduate Committee immediately prior to the beginning of the semester of

admittance. At this time, a program of study for the student is planned. Requests for academic credit for graduate-level courses taken as part of graduate training at another institution should be made at this time.

The Master's degree candidate is expected to choose a Major Professor (i.e., thesis advisor) by the beginning of the second semester of study. The Major Professor aids the student in selecting courses and in making other academic decisions and directs the student in their thesis research. The student may change her/his Major Professor at any time. In such a case, both student and professor shall provide written notice to the DGS.

II. Academic Requirements

A Master's degree candidate must successfully complete no fewer than 30 credit hours at the graduate level. A minimum of 24 credit hours of graded course work at the graduate level is required, exclusive of 800-level and 900-level research courses. Included in this total must be 2 credit hours earned in BIOL8250 "Scientific Presentations & Writing" and BIOL 8270 "First Year Introduction to Research" or their current equivalents, during the first two semesters of study. Also required is a one-credit course in Research Ethics (BIMS 7100).

Satisfactory progress in graduate-level course work is governed by the policies of the Graduate School as described above for Ph.D. students.

III. Residency Requirements

All work for the Master's degree must be completed within five years from the time of admission. Residency requirements are set by the Graduate School of Arts and Sciences and can be found in the Graduate Record.

IV. Master's Thesis Committee

A Master's student's Thesis Committee is chaired by the Major Professor and consists of two other faculty of the Graduate School of Arts & Sciences (GSAS) appointed in the Department of Biology. In consultation with the Graduate Committee, the DGS approves the composition of each Thesis Committee at the time the Thesis Committee is assembled, by the end of January in the first year of study, and when changes in the composition of the Thesis Committee are requested. With the approval of the Director of Graduate Studies, faculty of other departments in the GSAS may serve on the Thesis Committee.

So that the Thesis Committee remains abreast of a student's progress, a student must complete at least one meeting every 12 months with their Thesis Committee, with the first meeting held no later than the end of the first year. This meeting is necessary to remain in good standing in the program. Subsequent to each meeting of the Thesis Committee, the Major Professor prepares a brief written report that describes the committee's appraisal of the student's progress as well as any directions or additional requirements set by the student's Thesis Committee. A copy of this report is to be submitted to the Graduate Program Coordinator for inclusion in the student's departmental record.

V. The Master's Thesis and Its Defense

Students should begin a thesis project during the second semester of their program. The student and the Major Professor jointly decide whether the student should embark on a library- or laboratory-based thesis. The library thesis entails an extensive literature search of a specific topic from which unifying concepts and themes are drawn for discussion and criticism. The laboratory thesis entails the completion of an original research project carried out under the supervision of the Major Professor.

Upon completion of the library or laboratory research, the student prepares a written thesis. This thesis must be prepared in the format specified by the Graduate School of Arts and Sciences in the pamphlet entitled "Physical Standards for Preparation of Dissertations and Theses."

The thesis must be approved in its final form by a Thesis Committee. If the Committee is satisfied with the thesis and does not require additional research or extensive rewriting, a thesis defense is scheduled. During the thesis defense, the student is examined orally on their knowledge of general biology and of their area of research specialty. For a student unable to demonstrate proficiency in this examination, reexamination may be required by the Committee.

Upon successful completion of the thesis defense, the student should ensure that the GSAS Final Exam Form is completed and signed by all members of the Thesis Committee; this form should be given to the Graduate Program Coordinator for signature by the Department Chair or Director of Graduate Studies.

VI. Title of the Degree

The Thesis Committee decides whether an M.S. or M.A. degree shall be awarded. Generally, the successful laboratory research thesis is awarded the M.S., while the successful library research thesis is awarded the M.A.

VII. Financial Support

Students in the Master's degree program are eligible for Teaching Assistantships and Research Assistantships, depending on the availability of funds. Students must maintain a cumulative grade point average of 3.0 to qualify for continued financial support. In addition, eligibility for continued support through Teaching Assistantships requires satisfactory performance by the student in their teaching assignments. Master's program teaching assistants are required to fulfill the same TA requirements and evaluation process, as described above for Ph.D. teaching assistants.

MASTER OF ARTS WITH SPECIALIZATION IN CONSERVATION BIOLOGY

This MA program is designed for completion *within a single year*, providing University of Virginia undergraduates the opportunity for a five-year program of study. Successful completion of this program results in the awarding of two degrees, a Bachelor's degree after four years of study and a Master of Arts degree after the fifth year of study. Students are expected to follow the procedures for the Master's Degree Programs in Biology except as noted below.

Students should select a graduate thesis advisor (Major Professor) prior to application to the program and develop plans for an independent project in conjunction with their intended thesis advisor prior to completion of their undergraduate degree. The independent project may be on any topic related to Conservation Biology agreed upon and supervised by the student's graduate thesis advisor. Independent projects may include research or projects structured around an internship with an institution doing work related to conservation. Most projects will be carried out during the summer between the fourth and fifth year and finished during the fifth year. Each student will select a Thesis Committee before the end of their first graduate semester.

The academic requirements for the MA with Specialization in Conservation Biology are 18 graduate credit hours of graded coursework, in addition to 12 graduate credit hours of independent research on an approved topic. The core course requirements include one course in Ecology, one course in Evolution, and a third class that may be in either subject. In addition, a graduate level methods course and seminar are required. The student's program advisors will evaluate the appropriateness of specific courses to each required area. Additional courses required of all M.A. students must also be taken.

In addition, to the standard MA thesis requirements, students are expected to give a public presentation of their thesis following their thesis defense.

MOUNTAIN LAKE MASTER DEGREE PROGRAM

A candidate for the Master's degree at Mountain Lake must meet the following requirements:

1. Acceptance to the program by the Graduate School of Arts and Sciences and the Department of Biology Graduate Committee.
2. Residence of at least 3 full summer sessions at the Mountain Lake Laboratory.
3. Successful completion of 30 hours (4 terms) of graded course work no more than 6 of which may be Non-Topical Research if the degree involves a thesis.
4. Completion of a library or a laboratory thesis.
5. Final examination and thesis defense.
6. Completion of all work within a period of 7 years.

Further information concerning the Mountain Lake Master's Degree Program is available from the Office of the Mountain Lake Biological Station located in Gilmer Hall.

MASTER OF ARTS IN TEACHING (M.A.T.) PROGRAM

The requirements for the M.A.T. degree are set down in the Graduate Record. Additional information is available through the University's Curry School of Education.