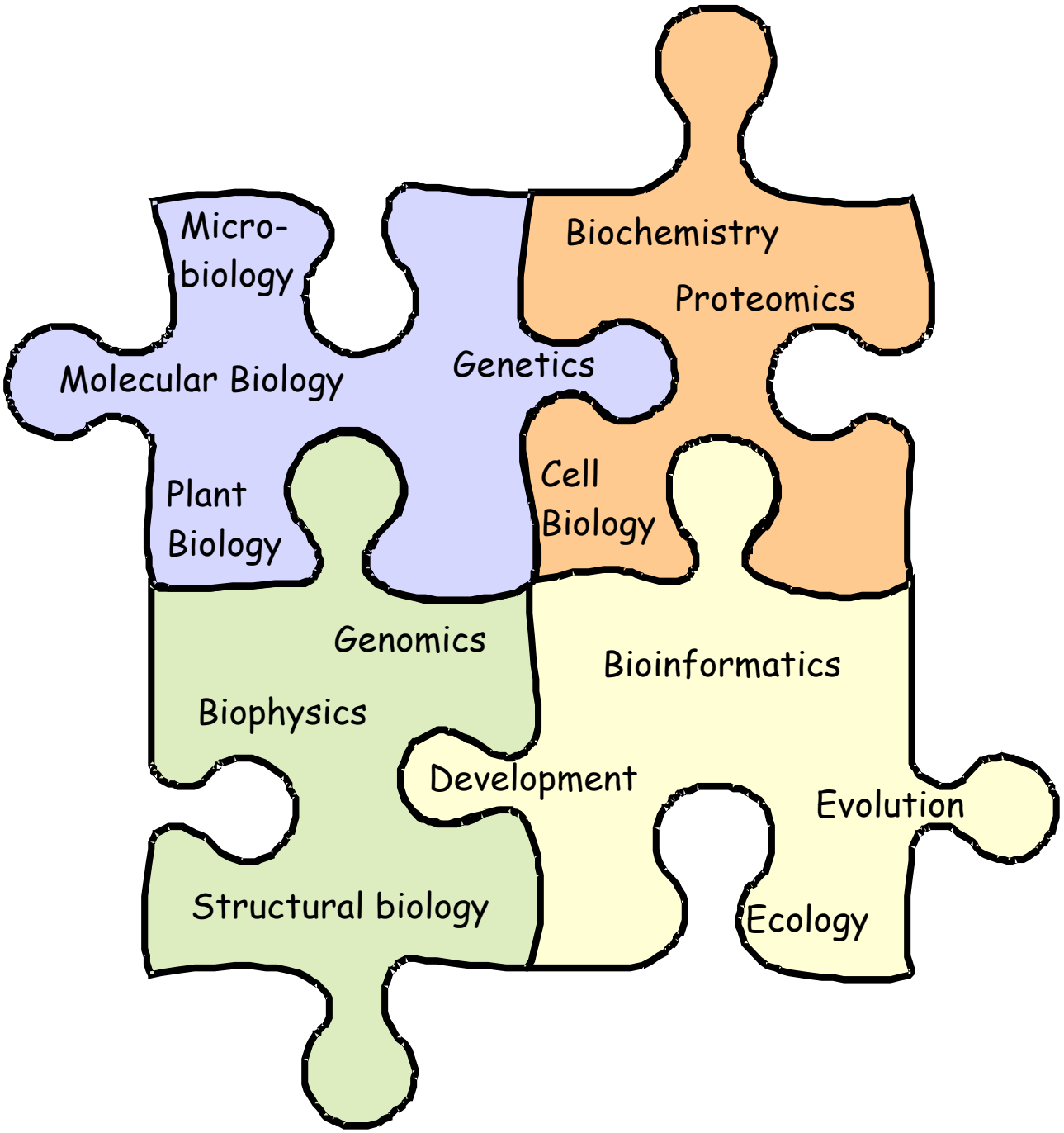
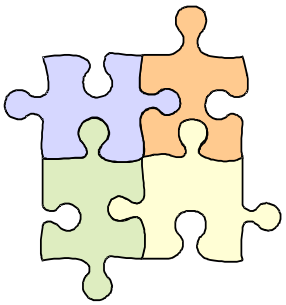
Department of Biological Sciences
Guide to Graduate Studies 2008-2009



To Our New Graduate Students,

Welcome to the Department of Biological Sciences community! You are now embarking on an exciting and challenging adventure of graduate studies with many new things to learn. We hope that you will approach all of the challenges of graduate work with enthusiasm, integrity, and perseverance. This handbook is meant to serve as a working guide to our Graduate Programs for the first year and beyond. If you don't find the information you need in this guide or on our website, don't hesitate to ask! You have our best wishes for success as you pursue excellence in your academic and scientific endeavors!

The Graduate Program Oversight Committee (GPOC)



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Roster of Graduate Program Faculty and Staff

Cathy Barr, Graduate Program Administrator
Karen Arndt, Associate Professor
Tia-Lynn Ashman, Associate Professor
Rajeev Azad, Research Assistant Professor
John Boyle, Assistant Professor
Jeffrey Brodsky, Professor and Acting Chair Fall term 2008
Gerard Campbell, Associate Professor
Walter Carson, Associate Professor
Deborah Chapman, Associate Professor
William Coffman, Associate Professor
Robert Duda, Research Assistant Professor
Michael Grabe, Assistant Professor
Paula Grabowski, Professor
Graham Hatfull, Professor and Chair, resumes Jan 1, 2009
John Hempel, Research Associate Professor
Roger Hendrix, Professor
Jeffrey Hildebrand, Associate Professor
Lewis Jacobson, Professor
Linda Jen-Jacobson, Professor
Susan Kalisz, Professor
Kirill Kiselyov, Assistant Professor
Jeffrey Lawrence, Associate Professor
Joseph Martens, Assistant Professor
Anil Ojha, Research Assistant Professor
Tim Nuttle, Research Assistant Professor
Valerie Oke, Assistant Professor
Craig Peebles, Professor
James Pipas, Professor
Rick Relyea, Associate Professor
Beth Roman, Assistant Professor
John Rosenberg, Professor
William Saunders, Associate Professor
Anthony Schwacha, Assistant Professor
M. Teresa Sáenz-Robles, Research Assistant Professor
Beth Stronach, Assistant Professor
Stephen Tonsor, Associate Professor
Brian Traw, Assistant Professor
Andrew VanDemark, Assistant Professor

See Department website for complete list of Faculty and descriptions of Faculty research interests : http://www.pitt.edu/~biology/

OVERVIEW AND PROGRAM ADMINISTRATION

Graduate Study in the Department of Biological Sciences at the University of Pittsburgh.

Goals

The goals of Graduate Study in the Department of Biological Sciences are to provide students with the training, guidance, experience, and opportunities to participate in research that will allow them to make the transition from being interested consumers of biological knowledge to being full, participating members of the biological profession. As such, they will be able to recognize the limits of our current biological knowledge and to use that insight to design and conduct research that addresses those limits. They will carry out research with the skill and integrity necessary to advance our level of knowledge. They will be able to integrate new insights from their research with existing knowledge and with advances from other biologists to generate new levels of understanding. They will also have the ability to effectively share their new insights with their colleagues, students, and others by lectures, in writing, and other forms of teaching.

Admission to the Program:

Traditionally, all first year students in our Department are supported by a School of Arts and Sciences fellowship. In the 2007-08 academic year, the Faculty established an additional mechanism by which potential students can apply directly to work with a faculty member in the EE or MCDB program, termed Direct Entry (DE). DE students are not eligible for support by School of A&S first year fellowships. The key differences between traditional students and DE students are:

1. Faculty will advertise for a DE student position, review potential candidates, and nominate qualified applications to the Graduate Recruiting & Admissions Committee for GPOC approval.
2. DE students are required to have a Masters degree or equivalent in a suitable area that has provided training approximately equivalent to that obtained by students in their first year of the MCDB or EE programs. This requirement can effectively substitute for the completion of the preliminary evaluation at the end of the first year. Therefore, DE students will not do rotations. The faculty sponsor and/or GPOC may require participation of DE students in some or all of the first-year core coursework to fulfill training deficiencies of the DE student. DE students are required to fulfill all other requirements of the MCDB or EE programs, including upper level graduate classes, attendance of seminars, passing their comprehensive exam in their second year, and thesis proposal.

3. Faculty accepting a DE student must provide a minimum of two-years of support with GSR monies, with the expectation that DE students will be primarily supported by GRS funds of the advisor.
4. DE students must complete one term of teaching as a Teaching Assistant, unless they have taught at an equivalent level for one term prior to joining the Department. In general, DE students are permitted to teach only one term as a TA. Additional terms as a TA are only available when given special permission from GPOC, such as when participating in the Teaching Minor Program.
5. The total number of DE students should not exceed 20% of the total graduate student body and there should not be more than 2 DE students per lab.

Programs of Graduate Study

There are two Programs of Graduate Study in Biological Sciences:

- **Molecular, Cellular and Developmental Biology (MCDB)**
- **Ecology and Evolution (E&E)**

These Programs operate with similar mechanisms for admission, advice and guidance, first year courses, research rotations, teaching requirements and dissertation research. These common aspects are described below, and unique aspects are described on pp. 19-26(MCDB) and pp. 27-31 (E&E). A Teaching Minor is also available to all students in our Department (p. 32-35).

DEPARTMENTAL WEBSITE http://www.pitt.edu/~biology/
We maintain an up to date, and easy to use website with information about our Graduate Programs, Faculty research interests, and policies for admission to potential applicants. The website is also useful for Department members, providing news and highlighting upcoming events. The website is maintained by "The Webmaster" (Dr. Jeffrey Lawrence) in conjunction with the Graduate Recruiting and Admissions Committee. Comments and corrections to the site can be directed to bioweb@pitt.edu.

Additional information on graduate study is available at the University of Pittsburgh School of Arts and Sciences Regulations Governing Graduate Study Website:
http://www.pitt.edu/~graduate/regtoc.html

Departmental Committees 08-09
Graduate Program

Director of Graduate Studies
Susan Kalisz (fall)
Gerard Campbell (spring)

GPOC
S. Kalisz (Chair-fall)
G. Campbell (Chair-spring)
T.L. Ashman
R. Hendrix
V. Oke
B. Roman
B. Saunders

Fellowship & Funding
T.L. Ashman (Co-chair)
B. Saunders (Co-Chair)
P. Grabowski

Recruiting
R. Hendrix (Chair)
M. Grabe
J. Martens
B. Stronach
B. Traw
A. VanDemark

Curriculum
B. Roman (Chair)
K. Arndt
W. Carson
S. Tonsor

TA oversight
V. Oke (Chair)
L. Daniels
C. LaFave
T. Schwacha

GRADUATE COMMITTEES DUTIES

The Director of Graduate Studies (DGS)

The DGS is responsible for all administrative aspects of the graduate program and reports to the Chair of the Department. The DGS is also the Chair of GPOC and thus ensures that each duty assigned to GPOC — as described below — is completed.

The Graduate Program Oversight Committee (GPOC)

GPOC is the highest-level graduate committee, to which each graduate subcommittee reports. Substantive changes to the graduate program are discussed first by GPOC and then by the faculty as a whole. The specific functions of GPOC include but are not restricted to:

- Coordinate an orientation program at the beginning of the academic year for incoming graduate students
- Track graduate student academic performance and ensure that students adhere to all requirements outlined in the Graduate Guide
- Monitor annual progress of each graduate student
- Assign comprehensive examination committee chairs
- Compile information for faculty at the end of each graduate students' first academic year in order to facilitate promotion to the second year

- Review graduate student policy and make recommendations to the DGS on revisions to the Graduate Guide
- Advise the DGS and Department Chair on new graduate student policies
- Address graduate student academic irregularities
- Approve major changes in a graduate student's direction of study and coursework
- Approve requests for enrollment in the Teaching Minor program, provide annual feedback on the Teaching Dossier, and validate final receipt of the Minor
- Provide a liaison between the Graduate Student Organization and faculty

Graduate Recruiting and Admissions (GRAC)

The primary goal of the GRC subcommittee is to solicit applicants for graduate study and to recruit prospective students. The Chair of GRC reports to the DGS. The specific duties include:

- Assisting in updating graduate materials on the Department website.
- Organize large-scale mailings and emails to contacts at other universities and to prospective graduate students.
- Maintaining and updating a recruiting database.
- Reviewing applications from individuals who are interested in graduate study.
- Scheduling and coordinating visits to campus of prospective graduate students.
- Maintaining contact with accepted students to actively recruit them to the Department.
- Responding to questions from the incoming student class prior to arrival.
- Coordinating with the graduate secretary to ensure that the application information and pertinent data on incoming students is communicated to the School Arts and Sciences.

Graduate Funding and Fellowships (GFF)

The goals of the GFC subcommittee are to identify and procure external support for graduate students in the Department, and to help identify students to compete for internal fellowship opportunities. The Chair of GFC reports to the DGS. Duties of the GFC subcommittee include:

- Write and submit applications for graduate student training grants.
- Solicit nominations and forward top-ranked applications for Andrew Mellon Fellowships to the School of Arts of Sciences.
- Maintain a database of external sources for graduate student funding.
- Distribute information to students and faculty on identified, external funding sources.

Graduate Curriculum Committee (GCC)

The Graduate Curriculum Committee subcommittee coordinates the curriculum requirements for both the MCDB and EE programs. The Chair of GGC reports to the DGS. Duties of GCC include:

- Prepare syllabi for the MCDB and EE Core Courses.
- Coordinate with the Chair and Associate Chair in staffing these courses.
- Monitor progress and proposed changes to the Core, Seminars, and Advanced Topics courses in MCDB and EE.
- Evaluate the effectiveness of the curriculum through student and faculty feedback.
- Recommend removal of courses that no longer meet Departmental needs.

TA Oversight Committee (TOAC)

The TA Oversight committee subcommittee is responsible for managing the Department Teaching Assistant (TA) program. The Chair of TAOC reports jointly to the DGS and the Chair of UPOC. TAOC duties include:

- Coordinate assignment of Teaching Assistantships.
- Develop Department policies for appropriate TA distribution guidelines.
- Develop and implement a program for formal preparation in teaching.
- Coordinate an orientation program for all teaching assistants.
- Evaluate graduate student teaching assistants to ensure "satisfactory" performance.
- Provide students with feedback on their teaching abilities.
- Address graduate student teaching irregularities.

IMPORTANT INFORMATION FOR ALL BIOLOGICAL SCIENCES GRADUATE STUDENTS

THE ADVISORY SYSTEM

Orientation Meeting

During the week prior to the start of the Fall term, an Orientation Meeting is conducted by the DGS or a GPOC representative to welcome students to the Department and provide information about the administrative organization of the Department, the advisory system, course registration, benefits, the Department Retreat, and student expectations and requirements.

Interim Advisor

First year graduate students in the MCDB and E&E Program are assigned an Interim Advisor for the first two semesters of graduate study. The Interim Advisor is assigned as the Faculty member with whom the student performs his/her first 10-week research rotation. Early in the first semester, the Interim Advisor evaluates the student's academic strengths and weaknesses and suggests remedial course work or reading as needed. Practical advice is given to the student about accurate documentation of the laboratory notebook, about the design and interpretation of experiments, and about performing literature searches relevant to the research project. In addition, the Interim Advisor provides guidance in the preparation of the research rotation presentations, which are meant to describe why the research project was undertaken, what approaches were used, what results were obtained and what the results mean. The Interim Advisor completes a written evaluation of the student's progress in the first research rotation and discusses the evaluation in detail with the student.

In January of the first year, the Interim Advisor meets with the student to discuss his/her progress in course work and research rotations. This meeting ensures that the student understands in what areas he/she is doing well and what improvements need to be made. Subsequent to the interview the Interim Advisor completes a written evaluation of the students progress. The evaluation is reviewed early in the Spring term by the DGS, and later by the full Faculty at the end of the first year. Written evaluations of the student's performance in the second and third research rotations are also reviewed by the full Faculty.

If at any time in the first year the student feels that the advising system is failing their needs, they should contact the DGS for advice or reassignment to a new Interim Advisor.

In May of the first year, the performance of each student in coursework, specific Program activities, and laboratory rotations is evaluated at a Faculty meeting, and the decision is made whether or not to promote the student to the second year of study. This is known as the Preliminary Evaluation. Graduate students are normally required to select a Dissertation Advisor prior to this meeting (see below), at which time the newly selected Advisor serves as the advocate for the student.

Dissertation Advisor

By May of the first year, each student selects a Dissertation Advisor, who will be the student's primary mentor. The Dissertation Advisor works closely with the student

throughout his/her graduate studies to foster excellence and integrity in the student's performance, and to help the student develop laboratory skills, critical thinking, and independence. The selection of the advisor is one of the most important decisions a graduate student makes. Although there is no formula for choosing an Advisor, the student's interest in the proposed research topic, the laboratory environment, and the ease with which the student interacts with the Dissertation Advisor are critical elements to consider in the selection process.

The Dissertation Advisor provides specific guidance on the direction of the research project, what methods are appropriate to accomplish research goals and a timetable for completion of each phase of the research project. The Advisor also helps the student with problem solving to overcome roadblocks in the project. Advice is also given on the completion of specific Program requirements, such as in the selection of advanced topics courses.

PhD COMMITTEES AND EXAMS

During the course of their PhD programs in Department of Biological Sciences, all students participate in a common series of committee meetings and examination described in the following paragraphs. The purpose, the structure of the related committees and timetables for these common requirements, meetings and exams are summarized in the table below. Specific requirements of the E&E or MCDB Programs are detailed in subsequent sections.

Committee & Meeting Requirements (time frame)	**Purpose**	**Committee Membership**	**Notes**
Choose committee (beginning of yr 2)	Feedback on and expertise in topics related to the development of thesis project Committee participates in Annual Meeting, Comprehensive Exam, Overview Meeting, and Dissertation Defense Meeting	Faculty advisor & 3 BioSci Faculty & 1 Outside Faculty*, ** Member [Committee can include more faculty if desired.]	Inform Cathy Barr of committee membership. * Dean must pre-approve outside faculty member who are not U. Pgh Graduate Faculty, this includes School of Medicine faculty. Send letter of request and C.V. of outside committee member to Graduate Dean. **Outside committee member must attend Overview Mtg. & Defense, but is encouraged to attend all meetings.

Committee & Meeting Requirements (time frame)	**Purpose**	**Committee Membership**	**Notes**
Annual meeting (yrs 2-graduation)	Feedback on thesis project is provided and general assessment of student's progress	Faculty advisor & 3 BioSci Faculty	Report form is available from/submitted to Cathy Barr annually. Outside committee member attendance is encouraged.
Comprehensive exam (Spring term of yr 2 or Fall term of yr 3)	General knowledge in field of study is assessed.	Faculty advisor & 3 BioSci Faculty	Report form is available from Cathy Barr & submitted to Dean. Outside committee member attendance is encouraged. Comprehensive exam can take the place of the annual meeting.
Overview or Prospectus Meeting (any time after completion of the Comprehensive Exam; can occur immediately following Comprehensive exam; must be completed at least 8 mos. before defense)	Dissertation proposal is presented for formal overview; Student officially becomes a PhD candidate.	Faculty advisor, 3 BioSci Faculty & 1 Outside Faculty* Member [Committee can include more faculty if desired]	Report form is available from Cathy Barr & submitted to Dean.
Dissertation defense (typically in yr 5)	PhD dissertation and seminar are presented and defended.	See Overview or Prospectus Meeting above	Report form is available from Cathy Barr & submitted to Dean.

FIRST YEAR REVIEW

A student's progress is evaluated each year he or she is enrolled in graduate school in the Department of Biological Sciences. At the end of the first year, each graduate student's performance in coursework and rotations is discussed at an end of the year faculty meeting. This review is the Preliminary Evaluation mentioned above. Students are either promoted to the second year, or put on probation if their GPA is less than 3.0 or asked to leave the Program. Students on probation have the opportunity to take coursework during the summer of their first year to bring their GPA above 3.0.

ANNUAL COMMITTEE MEETINGS

Beginning in the second year and every year until graduation, students are required to hold annual committee meetings. These meeting serve as an opportunity for the student to gain feedback and insight from committee members as the student develops his or her thesis research and for the committee to evaluate the student's progress towards our Program requirements. Typically, the student and Faculty Advisor select three committee members from the Faculty of the Department of Biological Sciences. The outside committee member is encouraged to attend these meetings, if possible, at the discretion of the advisor/student.

Prior to each annual committee meeting, the student distributes a comprehensive written summary of research over the past year (including figures/graphs) and/or coursework of the to each member of the committee. During the meeting, the student gives an oral presentation describing the research accomplished, experimental results obtained, conclusions drawn, and future directions of the research project. This is an important opportunity for feedback on your thesis project. After the meeting, the student and the faculty advisor work together to complete a one-page report summarizing the outcome of the meeting and the year (e.g. grant proposals submitted, manuscripts submitted, etc). This form is available from the Graduate Program Administrator, Cathy Barr. The completed report must be signed by all committee members and returned to Cathy Barr. Copies of the completed form should be given to all committee members. GPOC reviews committee reports annually, and based on yearly progress in coursework and whether annual committee meetings have taken place, determines whether a graduate student is making sufficient progress. If not, GPOC can recommend that a student be terminated from the Graduate Program. This recommendation is forwarded to the Department Chair, who will render a final decision.

DISSERTATION COMMITTEE

Near the beginning of the second year in the Program, student and Faculty Advisor invite faculty members to serve on the comprehensive exam and dissertation committee. Typically, three Graduate Faculty in the Biological Sciences Department are on the comprehensive exam committee. At this time, an outside committee member not in the Department of Biological Science but on the Graduate Faculty of the University of Pittsburgh or another University is also identified. If a member of the Graduate Faculty from another university *or* a faculty member from the University of Pittsburgh School of Medicine who is not on the Graduate faculty of the School of Arts and Sciences is proposed as an outside committee member, the Assistant Dean of Graduate Studies must approve this selection in advance of the exam. The request for approval should be sent to the Associate Dean as a letter stating the justification for the appointment and a current curriculum vita of the outside committee member. The outside faculty member should be selected on the basis of contributions he or she can make by virtue of the particular areas of scholarly interest or expertise relevant to the dissertation topic. Non-faculty scholars with special competence in the area of research of the dissertation may also be appointed as an official member of the doctoral committee. The outside member must attend both the Overview meeting and the PhD defense, but is encouraged to attend all annual meetings. Committee composition should be reported to Cathy Barr in writing or by email as soon as the committee composition is finalized.

COMPREHENSIVE EXAM

The Comprehensive Examination is designed to assess the student's mastery of the general field of doctoral study, the student's acquisition of both depth and breadth in the area of specialization within the general field, and the ability to use the research methods of the discipline. It occurs at the end of the 2nd year or beginning of the 3rd year, around the time of the completion of the formal course requirements. The comprehensive examination meeting can occur immediately before the Overview or Prospectus meeting (described below). The outside committee member is encouraged to attend these meetings, if possible, at the discretion of the advisor/student.

Each student must prepare a written thesis proposal and give an oral presentation to the doctoral committee at a formal dissertation overview or prospectus meeting. The document and presentation provides detailed motivations, background, rationale and plans for the proposed research. This permits the committee members to provide guidance in shaping the conceptualization and methodology of the proposed project. The thesis proposal must be circulated to the committee at least two weeks in advance of the overview meeting. This meeting should occur at least eight months before the scheduling

of the dissertation defense and can occur immediately after the Comprehensive Exam. If the doctoral committee unanimously approves the thesis proposal, the student is admitted to candidacy for the doctoral degree. The outside committee member must attend this meeting and the dissertation defense.

DISSERTATION RESEARCH

Dissertation research commences when the Dissertation Advisor is chosen and continues at least until the Dissertation Committee agrees that an acceptable body of work has been completed to prepare the dissertation. As indicated above, meetings between the student and the Dissertation Committee are required yearly in order to assess the student's research progress and to rectify any oversights in the design or execution of specific experiments. The Ph.D. is awarded following successful defense of the dissertation with a public seminar and satisfaction of all other University, Department and Program requirements. Students are required to provide their committee with a complete copy of their dissertation at least 2 weeks in advance of the defense.

At the University of Pittsburgh, all dissertations are submitted as PDFs and published electronically. The Electronic Theses and Dissertations (ETD) web site provides step-by-step instructions, workshops, tutorials, training and support to aid graduate students in this endeavor (http://www.pitt.edu/~graduate/etd/).

DISSERTATION DEFENSE

The dissertation defense begins with a formal seminar presented by the doctoral candidate to the Department. The final oral examination in defense of the doctoral dissertation is conducted by the dissertation committee and occurs directly after the seminar. The student must distribute copies of the thesis to each member of the dissertation committee at least two weeks in advance of the defense. The outside committee member must attend the defense.

OTHER PhD REQUIREMENTS

COURSE REQUIREMENTS AND OPTIONS

The two programs of graduate training have similar structures for the first-year curriculum and somewhat different structures for subsequent years. Each of the Programs offers a modular core course as a requirement for all first-year students (Current Topics in Ecology and Evolution and Current Topics in Molecular, Cell and Developmental Biology) and research rotations. Students in the E&E and MCDB Programs also take graduate seminar courses. See specific Program information below.

Courses outside the Department

The Graduate Program Oversight Committee, in collaboration with the Curriculum committee evaluates and decides on requests from graduate students to take courses outside the Department. GPOC has generated a list of pre-approved courses outside the Department that fulfill requirements toward students' degrees (Appendix A). If you are interested in taking a course outside the Department of Biological Sciences to fulfill a graduate course requirement toward your PhD that is not pre-approved, you must do the following:

1. Consult with your thesis advisor about appropriate courses.
2. Check to see if the course is on the past-courses-approved-by-GPOC list (Appendix A).
3. Obtain an *electronic copy of the current course syllabus* (and lecture topic schedule if possible) and send it to the Director of Graduate Studies/GPOC Chair along with your *request to take this course. Obtaining the current syllabus must be done even if a course was previously approved.*
4. Ask your thesis advisor to document his/her approval of the course by sending an email to the Director of Graduate Studies/GPOC Chair stating his/her support of your enrollment in the course.

Upon receipt of the three documents (student request, current syllabus, faculty advisor approval), the Director of Graduate Studies/GPOC Chair will circulate the documents to all members of GPOC for approval. The Director of Graduate Studies/GPOC Chair will inform the student of the committee's decision in a timely fashion.

RESEARCH ROTATIONS

Students in both the MCDB and E&E programs perform research rotations in the first year. These rotations supplement classroom-based educational opportunities and provide settings for students to interact with faculty, who may serve on their dissertation committees or be their advisor, and to meet the members of different labs. Students present their results at the end of each research rotation as a brief talk. Details for each Program are provided below.

DEPARTMENTAL SEMINARS

All graduate students are expected to attend Department seminars and participate in Program activities throughout the course of their graduate study. Often, informal lunches or receptions are held for invited seminar speakers with the graduate students and postdoctoral fellows. This is a valuable opportunity to interact with prominent scientists, to ask questions about the seminar, the research field, or job opportunities.

RESEARCH ETHICS

All graduate students currently enrolled in the Department must complete the Responsible Conduct of Research module offered on the Internet-based Studies in Education and Research before they can receive either the M.S. or Ph.D. degree. This module has six chapters and can be found at the following link: https://cme.hs.pitt.edu/servlet/IteachControllerServlet?actiontotake=loadmodule&moduleid=1502
This course covers topics in Responsible Authorship and Publication Practices, Data, Mentoring, Conflict of Interest, Other Investigator Responsibilities, and Research Misconduct. In total, the course provides insight into situations germane to students now and into the future. **NOTE:** Upon successful completion of the entire web-based module, each student that completes the module must print the certificate of completion for his/her official records. One copy of this certificate must be given to the graduate secretary (Cathy Barr). The student should retain a second copy of the certificate for their records.

To supplement the generalized instruction received via the web module, students are also required to attend at least two seminars in research ethics and/or bioethics that are offered annually by the Department prior to Admission to Candidacy. Students are expected to attend them each subsequent year prior to receiving their degree. Attendance is also required at a question and answer session with the ethics seminar speaker immediately following the seminar. The seminar will augment graduate student training in research ethics by providing more current and specific information, and the discussion session will allow an expert in the field to answer questions that arise from the student's ongoing research experiences and from the web module.

DEPARTMENT RETREAT

The annual Departmental Retreat, usually held at the Pymatuning Laboratory of Ecology, offers an opportunity for first-year students to meet Faculty, postdocs, fellow graduate students, and other members of the Department. The retreat is held near the beginning of the Fall term and members of the Department, including all entering students, are expected to attend. Faculty graduate students and postdoctoral fellows present research talks and posters in an informal atmosphere. But don't let the informal atmosphere fool you! The talks and posters display the exciting research being accomplished by our next-door lab neighbors, and the labs on other floors. To add to the excitement, there is also a prize awarded for the best poster presentation by a graduate student. Ample opportunities for sports and recreation are provided: canoeing, hiking, camp fires every night, and best of all - Dr. Tony Bledsoe's bird walks!

CONFLICT RESOLUTION

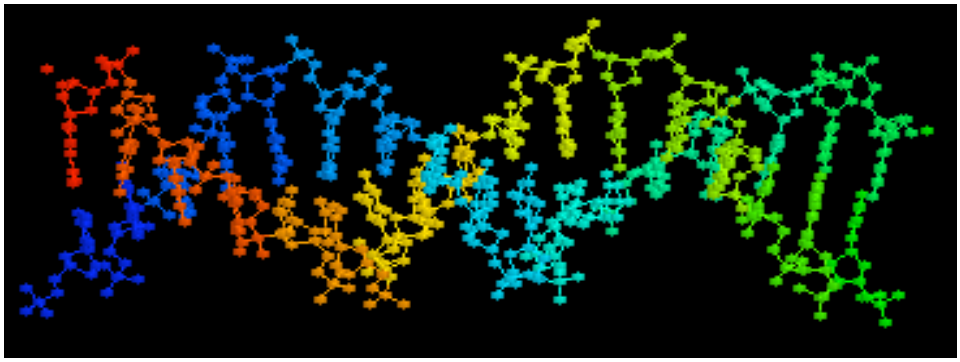
Significant conflicts between student and Faculty Advisor are not common, but should they arise, the following steps should be taken. All attempts should be made to resolve the conflict with the Dissertation Advisor, or with the Dissertation Committee. In practice, many conflicts are resolved with the help of the Committee. If this is not successful, the student can communicate their concerns to the DGS, and/or to the Chair of the Department. Disagreements that cannot be resolved at the department level should be taken to Associate Dean of Graduate Studies and Research, Nicole Constable in the office of School of Arts and Sciences Graduate Studies (412 624-6094).

RESPONSIBILITIES OF THE STUDENT

- Students are expected to strive for excellence and operate with integrity in all aspects of their course work and research responsibilities throughout their graduate studies.

- It is the responsibility of the student to be aware of the requirements of their specific Graduate Program and to fulfill these requirements in a timely manner. Students should also be familiar with University of Pittsburgh policies related to Graduate Studies found in the School of Arts and Sciences Graduate Student Handbook of Policies & Requirements (http://www.as.pitt.edu/graduate/policies/handbook.php).

- It is the responsibility of the student to communicate regularly with their Faculty Advisor and to seek specific advice about academic problems or concerns in a timely manner. Written and oral course work, performance of laboratory experiments, time management, balancing course work with laboratory duties, and career paths and opportunities are appropriate points of discussion.



GRADUATE PROGRAM IN MOLECULAR, CELLULAR & DEVELOPMENTAL BIOLOGY

Requirements for the Ph.D. Degree

First Year

- Current Topics in Molecular, Cellular and Developmental Biology (A modular core course composed of three two-credit courses in the Fall and Spring terms)
- Graduate Seminar Course (two terms)
- Friday Noon Seminar (two terms)
- Department Seminar (two terms)
- Research Rotations (three different laboratories)

Second Year and Beyond

- Completion of MCDB Dissertation Research Proposal
- Comprehensive Exam
- Dissertation Research
- Presentation at the Friday Noon Seminar series
- Friday Noon Seminar attendance
- Department Seminar attendance
- Advanced Topics Courses: Four credits of graduate-level coursework, satisfied by courses offered in the Department of Biological Sciences, or courses offered elsewhere and approved by the Director of Graduate Studies.

Teaching

One term of satisfactory performance as a Teaching Assistant is required some time after the first year. Preferences for TA assignments are solicited from graduate students annually by the Chair of the TA Oversight Committee (see page 7). Final TA selections are then made by the committee in consultation with the Director of Graduate Studies.

Evaluations and Exams

- Continuation into the second year is contingent upon a successful Preliminary Evaluation by the Department Faculty, including rotations and coursework
- Thesis proposal
- Students who wish to become Ph.D. candidates must pass the Comprehensive Examination at the end of the second year
- Students officially become Ph.D. candidates upon completion of an "overview meeting" that takes place once significant research progress has been made toward the dissertation. This meeting is usually coincident with a student's annual committee meeting and all members of the Dissertation Committee must approve Ph.D. candidacy.
- The Ph.D. degree is awarded upon submission, oral defense and acceptance of a research dissertation.

The M.S. Degree

Students are not normally admitted to the MCDB Program to pursue the M.S. degree, but it is sometimes necessary for a Ph.D. student to transfer to the M.S. track. This most likely occurs as the result of an unsatisfactory performance in the Ph.D. Comprehensive Examination, but can occur for other reasons as well. Such students must complete the requirements for a Master's degree within the time limits stated above in the overview of the graduate Programs.

The requirement for passing an M.S. Comprehensive Examination is met by an oral exam based on a brief (about two page) proposal for the Master's thesis research. The organization and administration of this examination is the same as for the "dissertation abstract" component of the Ph.D. Comprehensive Examination, except that the scope of the research proposed should be appropriate for a Master's thesis and therefore less than for a Ph.D. dissertation. For students who transfer to the M.S. track after attempting the Ph.D. Comprehensive Examination, the Committee has the option of deciding that the abstract component of that exam meets the requirement for an M.S. comprehensive exam.

Research Rotations

The research rotation system is guided by several goals of the training program: to develop breadth of laboratory experience, to supplement classroom-based educational opportunities, to provide opportunities for several Faculty members to assess the research potential of individual first-year students operating in different settings, and to enable first-year students to identify an appropriate laboratory and Dissertation Advisor for their dissertation research. First-year students should consider the scientific approaches of a potential Dissertation Advisor and their intrinsic interest in the research problem.

Three rotations in different laboratories are required for graduate students in the MCDB Program in the first year. Dates for the research rotations in the 2008-09 academic year are as follows:

Rotation 1, 08/27/08 thru 11/04/08 November 5, First Rotation Talks
Rotation 2, 11/06/08 thru 02/03/09 February 4, Second Rotation Talks
Rotation 3, 02/05/09 thru 04/14/09 April 15, Third Rotation Talks

ROTATION PRESENTATION GUIDELINES

Short (15 minute), oral presentations are required at the end of each Rotation in the MCDB Program (dates indicated above). The purpose of the rotation presentation is to *concisely* describe what research question/hypothesis was addressed and why, what experimental approaches were used, what results were obtained, and what the results mean. How well the results answer the question, what new questions arise from the project, and how the experiments could continue if there was more time should be discussed at the end of the presentation. Information in the published literature should be integrated into the talk, if relevant. It is the responsibility of the student to seek advice from the Rotation Advisor about how to prepare for the presentation. A practice run-through of the talk with the Rotation Advisor and members of the host laboratory is recommended. As in other facets of graduate work, it is expected that students will strive for excellence in their presentation.

THE DISSERTATION RESEARCH PROPOSAL

This is a writing requirement for graduate students in the MCDB graduate program and must be completed and passed by the Dissertation Committee before a student can proceed with their Comprehensive Examination.

Purpose

To assess the ability of a student to write a well-reasoned proposal on their dissertation research that includes a review of the general subject area, a list of specific aims and hypotheses they will be testing, and a reasonable set of experiments they will pursue. It is intended that the dissertation advisor will mentor the student through the writing of this proposal, but it is important that the document reflect the original ideas and goals of the student. The document cannot be a simple restatement of the advisor's grant proposal, but can be guided and influenced by existing research objectives in the lab. This requirement is intended to improve scientific writing skills, instruct students in the art of grantsmanship, and help focus a student's research project early on in their careers. While the proposal will serve as a research guide, the student will not be required to accomplish the specific aims outlined in the proposal in order to graduate.

Format

The subject of the proposal will be the dissertation research the student intends to pursue. The proposal itself will follow the NIH guidelines for a Research Plan except that it will be limited to 5 pages (0.5 inch margins, 12 point text, single spaced, not including references and figures). Details are as follows (modified from the NIH guide to preparing research grants):

Organize the proposal to answer these questions:

1. What do you intend to do?
2. Why is the work important?
3. What has already been done?
4. How are you going to do the work?

Divide the proposal into the following sections:

a. Hypotheses and Specific Aims. List the broad, long-term objectives and what the specific research proposed in this application is intended to accomplish, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, or develop new technology. **One half page recommended.**

b. Background and Preliminary Studies. Briefly sketch the background leading to the present proposal, critically evaluate existing knowledge, and specifically identify the gaps that the project is intended to fill. This section will include preliminary results obtained by the student, either during a rotation or shortly after joining the lab. This section can also include relevant, unpublished studies from the lab. **1-1.5 pages recommended.**

c. Research Design and Methods. Describe the research design and the procedures to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted. Describe any new methodology and its advantage

over existing methodologies. Discuss the potential difficulties and limitations of the proposed procedures and alternative approaches to achieve the aims. This section should include the series of experiments that will be pursued over a period of about twelve months or longer if deemed appropriate by the dissertation advisor. **3-3.5 pages recommended.**

Timetable and Evaluation

During the summer of the first year, the student and thesis advisor should collaborate to establish the research theme and begin to generate the written document. The advisor will guide the student through all aspects of writing the proposal, but the proposal itself must be the written work of the student alone. The first draft of the proposal must be submitted to the advisor by September 1 at the beginning of the second year. The advisor will provide feedback and the student will do as many rewrites as the advisor deems necessary to generate a cohesive research plan.

To help in this initial review process, fellow second year students will critique each other's proposals. This peer review component will give the students an outsider's view of their research in a more relaxed atmosphere. At the beginning of September the Chair of GPOC will divide the students into groups of three or four. Within a group, each student will read the proposals of the other members of the group (after the advisor has provided preliminary feedback). The students will then meet and discuss each other's proposal (in the absence of any faculty member). This meeting should take place by the end of September.

A completed proposal will be presented to the dissertation committee by November 1. Members of the dissertation committee will review the proposal and by December 1 the committee chairperson (i.e. not the advisor) will inform the student if it meets the required standards and whether the student has passed. Historically, the dissertation committee functions to ensure that the breadth and quality of the research meet an expected threshold and its power is limited to oversight of a student's progress. This role will not change as it relates to this document, and it is the responsibility of the student and research advisor to work together to establish the direction of the proposed research project. The role of the dissertation committee is to evaluate the finished document for the overall quality and, when necessary, make recommendations as to how to improve particular facets of a given proposal. These include, for example, aspects such as writing style, alternative approaches and outcomes, methods of quantification and statistical analysis, or relevance to other model systems. If the committee feels that the proposal can be improved, the chairperson should discuss the concerns of the committee with the student and the advisor. If it is thought necessary, a full committee meeting with the student may be held to do this. The student will then rewrite the

proposal and submit the revised version to the committee by the first day of classes in January. The committee will review the revised proposal- by February 1 the committee chairperson will inform the student if it meets the standards required and whether the student has passed. Only one rewrite is allowed. This process must be completed before the student submits proposed Comprehensive Examination topics to their committee. Failure to complete this requirement prevents promotion to the third year.

Alterations to the current Comprehensive Examination

The Dissertation Research Proposal replaces the previously required Dissertation Abstract that was submitted to the dissertation committee along with proposed Comprehensive Examination topics.

MCDB GRADUATE RESEARCH PRESENTATIONS (FRIDAY NOON SEMINAR)

In this course, MCDB students present a seminar of their research in progress (proposed projects, recent data, and experimental problems) to Faculty, students and post-docs. Presentations are about 45 minutes and each student must present at least once a year. **Abstract**: Approximately one week prior to the seminar, the student prepares an abstract of his/her dissertation work for distribution to members of the Department. Abstracts should be sent to Dr. Jeffrey Lawrence (jlawerenc@pitt.edu) Questions, comments, criticisms and suggestions from the audience are encouraged. A list of speakers, which may include postdoctoral fellows and graduate students from other departments who work in our Department, is circulated in advance. All graduate students in the first year and beyond are expected to attend each and every Friday noon seminar, and to participate in the informal feedback session at the end of the seminar.

TIMETABLE FOR THE COMPREHENSIVE EXAM

MCDB students take their exam at the end of the second year, or one year after passing the Preliminary Evaluation (p. 10). At this point, students are expected to have completed the core course. The examination will progress according to the following schedule (in 2009):

Submission of proposal topics to committee:	February 6th.
Choice of proposal topic:	March 6th.
Submission of written proposal:	April 10th.
Oral Examination:	May 1st.

Format

The Written Proposal

The examination process is initiated by the student submitting to the Committee a Dissertation Abstract (see below) AND three possible topics for the research proposal. These topics are **not** in the area of the student's dissertation research nor can they be directly related to any of the ongoing projects in the student's laboratory. The Committee chooses among these topics and notifies the student of their choice. If none of the three topics are deemed suitable, the Committee will meet to develop a topic in consultation with the student. The nature of the topic should be a well–defined biological problem that is not resolved in the current literature.

Students have approximately six weeks to write the proposal. The format of the written proposal is that of an NIH grant application. It follows the NIH guidelines except that the length is limited to fifteen pages, not including references. This written proposal is evaluated with respect to experimental feasibility, conceptual foundation, originality and imagination, writing style and knowledge of the relevant literature. Students are encouraged to discuss how to prepare this document with the Chair of their Examination Committee (who is appointed by the DGS) and to read grant applications submitted by their Faculty mentors and other Faculty in the Department. As the proposal is developed, both general and specific information about useful experimental methods and approaches may be gathered from any reputable scientific source, with appropriate citations of course, including the published literature, online resources, and informal discussions with other scientists, including other students and Faculty. Ultimately, the completed written document shall be the student's own written work, and as such, it must not be a product involving detailed editing or other substantial collaboration with anyone else. Students are permitted to present a practice talk prior to the Oral Examination (see below) to their peers, as long as Faculty are not in attendance. When the proposal is deemed finished by the student, copies shall be submitted to each member of the Committee. These copies may be delivered as printed or electronic documents, at the discretion of the Committee members and the DGS reviewing them.

Dissertation abstract

The Dissertation Abstract **(due February 8)** is not more than two pages in length, and includes an exposition of the problem, question, or hypothesis the student is addressing, an outline of the experimental plan, and the experimental approaches to be used. Inclusion of preliminary data is not necessary. The abstract is intended to ensure that the grant proposal is distinct from their dissertation research and that satisfactory research progress toward the dissertation is being made.

Oral examination

Approximately 2-3 weeks after submission of the written proposal the student meets with his/her Committee for the oral examination. The exam should not exceed two hours. The Committee evaluates the student's grasp of the basic concepts of the research proposal, familiarity with experimental approaches, and rationale. The Committee may address any reasonable area of knowledge deemed to be necessary for successful execution of the research project. At the end of the oral exam the Committee (in the absence of the student) votes (pass/fail) on the performance of the student. Both the written and the oral parts are considered. The Chair of the Committee communicates the decision to the DGS and a copy of the proposal is added to the student's dossier.

The Conditional Pass: Under some circumstances the Committee may give the student ONE opportunity to correct specific deficiencies in the proposal and/or oral defense within a strict time limit (4-6 weeks). The Chair of the Committee will provide, in writing, an evaluation of the written proposal and oral exam that outlines the areas that the student must improve or correct in order to pass the comprehensive exam. The evaluation should reflect the opinion of the entire Committee. Copies of the written evaluation should be provided to the student and to the Graduate Secretary to be included in the student's dossier. It is recommended that the student receive mentoring from their thesis advisor or any committee member during the resubmission process, but the proposal must still represent the student's own work. After resubmission of the written proposal, or reexamination, the Committee will render a final decision. If a pass is not achieved at this time, the student shall elect to leave the Program or request a transfer to the M.S. track.

GRADUATE PROGRAM IN ECOLOGY AND EVOLUTION

Requirements for the Ph.D. Degree

I. ACADEMIC ADVISING

Category	Requirement	Comments
Entry Consultation and Evaluation	E&E representative to GPOC and the Advisor, if already chosen, meet with each first-year student in the first 2 weeks and advise him or her on initial course work and deficiencies. The student must provide a list of all relevant experiences and courses, including grades. If the student has not yet chosen an Advisor, then the Interim Advisor (first rotation sponsor) and the GPOC representative meet with the student.	
Dissertation Advisor	Chosen by the end of the second semester but often upon entry into the Program.	
Dissertation Committee	Chosen at the beginning of the second year: Comprised of the Dissertation Advisor, three Departmental members, and one Outside member.	Department members include adjunct Faculty who are members of the Graduate Faculty. The Outside member must come from outside the Department and may come from outside of the University. Dean's approval is required for the outside member

II. COURSE REQUIREMENTS

Category	Requirement	Comments
Core Course	BIOSC 2500 Current Topics in Ecology (3 credits) and BIOSC 2510 Current Topics in Evolution (3 credits).	Students are strongly encouraged to take the Core Courses prior to their comprehensive exam and within their first two years in the program.
Seminars	BIOSC 2520, 2530, 2540, and/or 2560. Four total are required.	Students can enroll for Seminar courses as multiple times as the topic is different each term.
Advanced Topics Courses	At least one required at the 2000 level.	Population Biology, Evolution and other courses are offered for graduate credit.
Field Course at the Pymatuning Laboratory of Ecology	One graduate level field course at the Pymatuning Laboratory of Ecology or equivalent is required, preferably in the first summer of graduate school, Many OTS graduate level courses could fulfill this requirement. www.ots.ac.cr	If a student can demonstrate completion of an equivalent graduate-level field course at another institution, then he/she can petition GPOC in writing to waive this requirement. Students wishing to take OTS courses should seek prior approval from GPOC and their Committee.
Research Rotations	Two 10-week rotations are required. Students will deliver an oral presentation about their research results at the end of each 10-week rotation. **Note:** Interested students can choose to do a third 10-week rotation. Dates of rotations are given below.	Rotation advisors will provide a written report of the student's rotation performance to GPOC. Student performance will be discussed during the May faculty meeting.

Research Rotation Presentations	**Rotation 1, 08/27/08 thru 11/04/08 Nov. 5**, First Rotation Talk **Rotation 2, 11/06/08 thru 02/03/09 Feb. 4,** Second Rotation Talk **Rotation 3, 02/05/09 thru 04/14/09 April 15,** Third Rotation Talk Short (15 minute), oral presentations are required at the end of each Rotation. The purpose of the rotation presentation is to *concisely*

Research Rotation Presentations, continued	describe what research question/hypothesis was addressed and why, what experimental approaches were used, what results were obtained, and what the results mean. How well the results answer the question, what new questions arise from the project, and how the research could continue if there was more time should be discussed at the end of the presentation. Information in the published literature should be integrated into the talk, if relevant. It is the responsibility of the student to seek advice from the Rotation Advisor about how to prepare for the presentation. A practice run-through of the talk with the Rotation Advisor and members of the host laboratory is recommended. As in other facets of graduate work, it is expected that students will strive for excellence in their presentation.

III. THESIS PROPOSAL, COMPREHENSIVE EXAMS, THESIS DEFENSE AND EVALUATION OF PROGRESS

Dissertation Proposal	Students are required to write and submit an NSF-style grant proposal to their dissertation Committee at least two weeks prior to the date of their comprehensive/overview exam.	Proposal guidelines can be found at the NSF website <http://www.nsf.gov/pubs/policydocs/papp/index.jsp> See Part I. Grant Proposal Guide
Comprehensive Exam & Overview Meeting	The meeting consists of three parts. Part one is a brief oral presentation (~30 minutes) by the student of their thesis proposal. Part two is the general comprehensive exam*, which covers topic areas and examines students for general knowledge in both ecology and evolution. Part three is the overview meeting, in which the student defends their dissertation proposal. If the committee unanimously approves the student's proposal, the student becomes	1. The comprehensive exam should be taken at approximately the time of completion of formal course requirements (~ end of yr 2 or beginning of yr 3). Students are strongly encouraged to take the exam as early as possible in their degree Program. Comprehensive exams must be completed no later than the end of the student's third year in the Program. 2. While the entire Dissertation Committee is present during the exam, only the Committee members, not the advisor, are

Comprehensive Exam & Overview Meeting Con't.	a PhD candidate. *In preparation for the general exam, the student should contact their Advisor and Committee members at least three months in advance to receive a list of topic areas and suggested readings.	initially allowed to ask questions. After the Committee members have finished their examination of the student, the student's Advisor can ask further questions. 3. The overview meeting must be completed at least 8 months prior to the Dissertation Defense.
Evaluation of Progress	Students must meet with the GPOC representative and advisor (yr 1) or hold annual committee meetings as required by the Graduate School. Students officially become Ph.D. candidates upon successful completion of their comprehensive exam, required course work and the approval of the student's committee in the overview meeting. The overview meeting occurs immediately after the comprehensive exam and signifies that sufficient progress has been made toward their degree.	Students submit an annual progress report form to the Graduate Secretary. Forms are available from the graduate secretary or E&E GPOC representative. <u>These forms are due on March 15</u> of each year. Students are required to give a copy of their most recent progress report to each Committee member prior to their annual committee meeting.
Dissertation	The dissertation details the research conducted by the PhD student. The written document must comply with University guidelines found at the website http://www.pitt.edu/~graduate/etd/	Student must provide their dissertation committee with a copy of the dissertation no less than 2 weeks before the date of the dissertation defense.

Dissertation Defense	Department-wide seminar followed by an oral defense of either Ph.D. dissertation with the entire Committee.	Upon successful defense of dissertation and committee approval, students must electronically submit their dissertation for publication by the University using ETD. http://www.pitt.edu/~graduate/etd/

IV. ATTENDANCE AND PRESENTATION OF SEMINARS

Annual Seminar Presentation	All students, including first-year students, are required to give a formal presentation of their research/research ideas every year.	This presentation may be given in the E&E Seminar series (Wednesdays 12:00 noon) or in the weekly seminar at the Pymatuning Laboratory of Ecology in the summer.
E&E and Departmental Seminar Series Attendance	Students are expected to attend the E&E Seminar (Wednesdays at Noon) and the Departmental Seminar (Mondays at 4:00 p.m.).	

V. ADDITIONAL COURSES

Journal Club	Students are expected to attend the weekly journal discussion group.	Students can sign up to receive credit for this course.

VI. TEACHING REQUIREMENTS

Category	Requirement	Comments
Teaching	One semester with satisfactory performance.	

TEACHING MINOR PROGRAM

The Department of Biological Sciences offers graduate students an optional Minor in Teaching that provides a more complete teaching experience beyond the one semester TA requirement. The Teaching Minor Program includes exposure to various methodologies and teaching philosophies, more independent experience in the classroom, and development of material suitable for a teaching portfolio. Students planning for a career with an education component are especially encouraged to join this Program.

Enrollment

Students who would like to enroll in the Teaching Minor Program should submit a petition to the Director of Graduate Studies via the Graduate Secretary. Petition for entry into the Teaching Minor Program can be made at any time. However, students are strongly encouraged to have successfully completed their Comprehensive Exam and must have two years left until completion of their M.S. or Ph.D. degree. The following items should be included in the petition:

(1) A letter from the student requesting entry into the Teaching Minor Program, and

(2) A letter from the student's faculty advisor giving permission to participate in the Teaching Minor Program.

Requirements

The requirements for the Minor are as follows:

A. **Two or more semesters of teaching as a Teaching Assistant or Teaching Fellow with satisfactory performance.**

B. **Enrollment for four semesters and receipt of satisfactory grades in BIOSC 2972 ("Teaching Minor in Biological Sciences").** This course is based around the completion of one independent teaching project each year (**two total projects**), as well as the production of the Teaching Dossier. Each project is expected to take approximately 10-15 hours. Of the two projects, at least one must be a guest lecture in a class, along with any material used in class, and exam questions. The projects cannot be ones used to complete FACDEV 2200 but can be projects in a class for which the student is serving as a TA if the project is in addition to the normal TA requirements. BIOSC 2972 meets

formally approximately two times a semester at times arranged at the beginning of the semester.

C. **Enrollment and receipt of a 'B' or better in FACDEV 2200 ("University Teaching Practicum").** Students should take FACDEV 2200 during a fall or spring semester (preferably not summer) while serving as a teaching assistant, ideally when teaching a course where there is some opportunity to participate in curriculum development. If this is not possible for whatever reason, then the student will need to identify a suitable course and to arrange to do guest lectures with the faculty member who teaches that course to complete assignments in FACDEV 2200 (two guest lectures are the minimum).

D. **Yearly meetings with two Teaching Mentors.** The student must ask two faculty to serve as Teaching Mentors. The two Teaching Mentors must be chosen during the first year in the program and declared when the Teaching Dossier is submitted for the first time. The student's research advisor may serve as a Teaching Mentor. At a minimum the Mentors should observe at least one class led by the student, observe independent projects as appropriate, meet with the student once a year to provide feedback on the Teaching Dossier and discuss other issues, and provide a teaching evaluation letter for the Dossier. The yearly meetings must be documented by filling out a report that includes a section for self-evaluation by the student and sections documenting the meetings with both Teaching Mentors. The meetings must occur each year until the final Teaching Dossier has been submitted to GPOC.

E. **Maintenance of a Teaching Dossier, which is submitted to GPOC via the Graduate Secretary by the first Monday in May each year.** The Teaching Dossier must be organized using a set template provided in BIOSC 2972 and will serve both to document the completion of the Teaching Minor requirements and to be an organized collection of all teaching and Teaching Minor material from which students can draw material for a teaching portfolio when on the job market. The Dossier should include a Teaching Philosophy statement, letters pertaining to enrollment in the Teaching Minor Program, a transcript, documentation of yearly meetings with Teaching Mentors, teaching evaluations, FACDEV 2200 material, BIOSC 2972 material, and samples of teaching materials. Maintenance of the Teaching Dossier is the responsibility of the student, although feedback on presentation will be given by the Teaching Mentors and in BIOSC 2972. The role of GPOC is to assess the Dossier to determine which Teaching Minor requirements remain to be fulfilled.

F. **Completion of 10 course credits.** These credits are derived from BIOSC 2972 (4 credits for the four semesters of participation and 3 credits for completion of the Dossier = 7 total) and FACDEV 2200 (3 credits).

Continuation in the Teaching Minor Program

Students enrolled in the Program must remain in good academic standing, and continuation in the Minor Program requires annual approval from GPOC. This approval is given in a letter to the student after the Teaching Dossier has been assessed each year.

Completion of the Teaching Minor Requirements

Upon completion of the requirements listed above, the student must submit the final Teaching Dossier to GPOC at or before the time that the dissertation or thesis is submitted to the student's Thesis Committee. In addition, students are strongly encouraged to submit the final Dossier within one semester of completing the Teaching Minor requirements if that is earlier than the submission of the thesis. GPOC will review the Dossier and, if all requirements have been met, will nominate the student to the Chair of the Department for award of the Teaching Minor.

Receipt of the Minor can occur only upon completion of a M.S. or Ph.D. from the University of Pittsburgh, and implementation of this Program does not change any existing Departmental requirements for the granting of graduate degrees.

Suggested Timeline for the Teaching Minor

A. At least two terms as a Teaching Assistant: typically one semester in the second year of graduate school and one semester in the third or fourth year of graduate school.
B. Petitioning for enrollment: typically at the end of spring term of the second year or the end of the fall term of the third year, after completion of the Comprehensive Exam.
C. Selection of two Teaching Mentors: during the first year in the Teaching Minor Program prior to submitting the Teaching Dossier for the first time.
D. Enrollment in BIOSC 2972: typically the first fall or spring semester after acceptance into the Teaching Minor Program and the three following academic year (fall and spring) semesters.
E. Enrollment in FACDEV 2200: ideally during a fall or spring semester when serving as a TA. Although FACDEV 2200 is offered during the summer, enrollment for this semester is not recommended because of insufficient time

to complete the necessary requirements. Typically students enroll while doing the second TA assignment.

F. Yearly submission of a Teaching Dossier to GPOC: first Monday of May of each year after acceptance into the Teaching Minor Program.
G. Final submission of the Teaching Dossier to GPOC: ideally the first semester after completing the Teaching Minor requirements, but at the latest by the time that the thesis is submitted to the student's Thesis Committee.
H. Receipt of the Teaching Minor: upon graduation.

Grandfather clause

Students who enrolled in the Teaching Minor Program prior to September 2007 but who have not yet completed the Minor will be caught in the middle of changing requirements. Starting in September 2007, all students will be expected to follow the new requirements EXCEPT for the details of completing BIOSC 2972. The old requirements were four semesters of BIOSC 2972, which was monthly meetings of Teaching Club, plus presentation at one Teaching Club. Students enrolled in the Teaching Minor Program prior to September 2007 who have not already presented in Teaching Club may EITHER prepare a one hour presentation for BIOSC 2972 (fulfilling the old requirement) OR do one independent project. Because the requirements were changed in order to provide better training in teaching, an independent project is encouraged.

Specific scenarios are as follows:

A. Student who has completed four semesters of BIOSCI 2972 as Teaching Club and presented once: Old requirement has been met and is acceptable.
B. Student who has completed four semesters of BIOSCI 2972 as Teaching Club and has NOT presented: Student is given the choice of doing a one hour presentation to BIOSC 2972 or doing one project under the new guidelines.
C. Student who has completed at least one semester of BIOSCI 2972 as Teaching Club and has presented once: Must attend BIOSCI 2972 for the remaining semesters and participate in discussions. Encouraged, but not required, to do one project.
D. Student who has completed at least one semester of BIOSCI 2972 as Teaching Club and has NOT presented: Student is given the choice of doing a one hour presentation to BIOSC 2972 or doing one project under the new guidelines. Must attend BIOSCI 2972 for the remaining semesters and participate in discussions.

Any other accommodations due to changing requirements must be approved by the Director for Graduate Studies.

Appendix A: Pre-approved Courses Outside Biological Sciences Department that Count Towards Degree Requirements (approved by GPOC; Fall 2008)

University of Pittsburgh

BIOINF 2051	Intro to Bioinformatics	3 cr.
BIOST 2041	Intro to Statistical Methods 1	3 cr.
BIOST 2042	Intro to Statistical Methods 2	2 cr.
IDM 2001	Molecr Biology Microbl Pathgns	3 cr.
INTBP 2040	Using Perl for Bioinformatics	3 cr.
MOLBPH 2001	Molecular Biophysics 1: Structure	3 cr.
MSBMG 2510	Biochemistry of Macromolecules	2 cr.
MSBMG 3510	Advanced Topics in Gene Expression	3 cr.
MSMVM 3410	Microbial Pathogenesis	2 cr.
MSMVM 3420	Viral Pathogenesis	2 cr.
MSCBMP 2840	Regulation of Membrane Traffic	2 cr.
MSCMP 2730	Molec Mehs Tis Growth & Diffrn	3 cr.
MSMPHL 2310	Principles of Pharmacology	3 cr.
MSMPHL 3330	DNA Repair: Biochemistry to Human Disease	2 cr.
PHYS 3101	Special Topics	1 cr.

Carnegie-Mellon University

BIOSC 0438	Physical Biochemistry	3 cr.
BIOSCI 0738	Physical Biochemistry	3 cr.
CMBIOSC 0711	Cmptl Molec Biol & Genomc	4 cr.