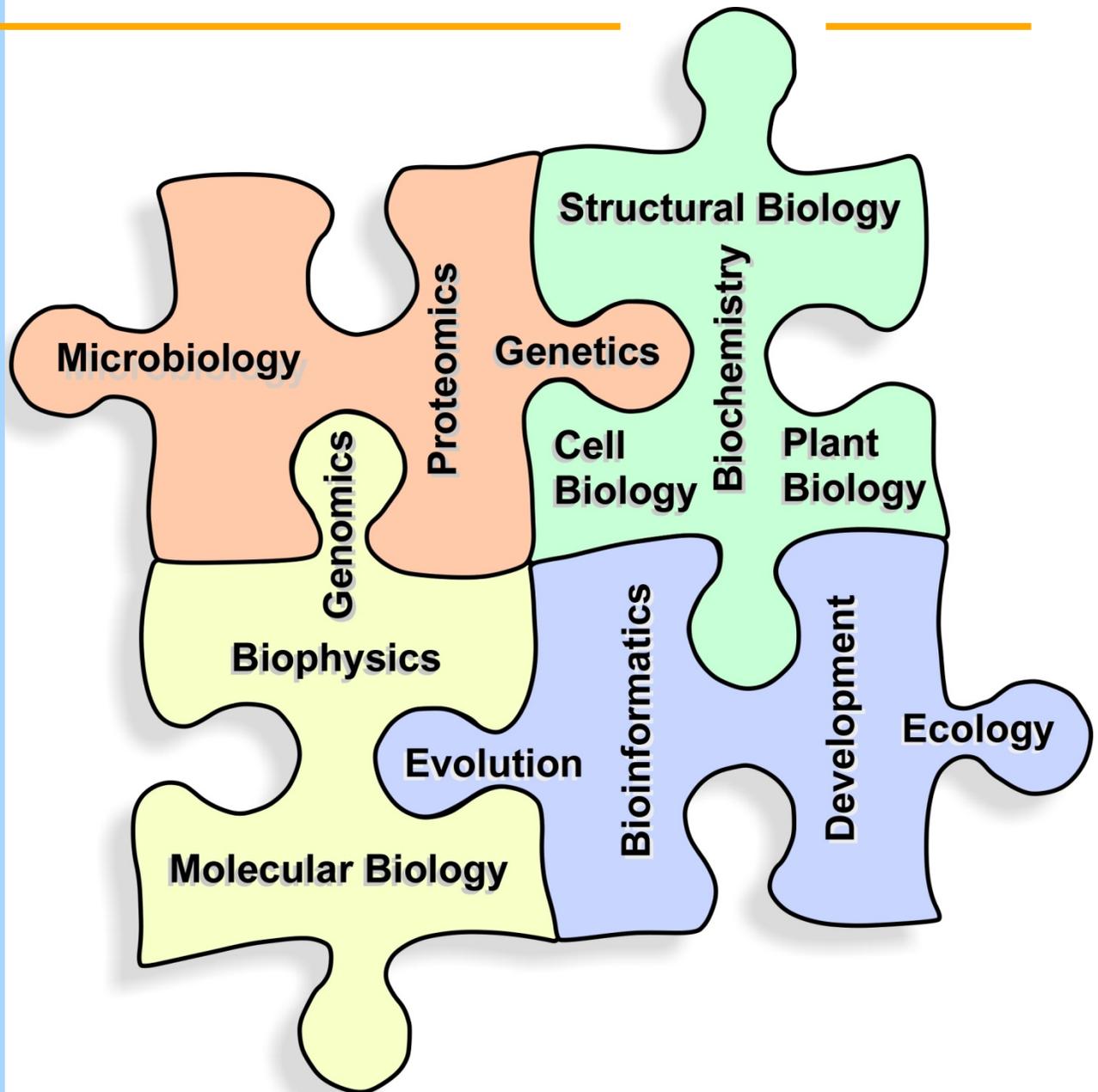




University of Pittsburgh

Department of Biological Sciences

Guide to Graduate Studies 2015-16



Ecology & Evolution • Molecular, Cellular & Developmental Biology

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)

Table of Contents

Overview and Program Administration	5
Graduate study in the Department of Biological Sciences	5
Goals	
Admission to the Program	5
Programs of Graduate Study	5
Graduate Program Faculty	6
Department Website	7
Departmental Graduate Committees	7
Graduate Committee Duties	8
The Director of Graduate Studies (DGS)	8
The Graduate Program Oversight Committee (GPOC)	8
Graduate Recruiting and Admissions Committee (GRAC)	8
Graduate Fellowships and Awards Committee (GFAC)	8
Graduate Curriculum & Assessment Committee (GCAC)	9
TA Oversight Committee (TOAC)	9
Graduate Student Advising System	10
Advising in the First Year	10
General Orientation Meeting	10
Graduate Student Mentoring Committee	10
Interim Advisor	10
Advising in the Second Year and Beyond	11
Dissertation Advisor	11
Dissertation Committee	11
Annual Committee Meetings	13
Graduate Program Requirements	14
University Requirement for the PhD Degree	14
Programmatic Requirements for the PhD Degree	15
Graduate Courses	15
Graduate Seminar Courses	16
Graduate Communications Workshops	17
Research Rotations	17
Overall student GPA	18
Research Ethics	18
Graduate Research Seminar	19
Departmental Seminar	20
Departmental Retreat	20
Teaching	20
Dissertation Research	20
Training Milestones and Statutes of Limitations	21
Committees, Exams and Meetings	21
Preliminary Evaluation: First Year Review	22
Probation After Preliminary Evaluation: First Year review	22
Comprehensive Exam	23
Overview Meeting and Admission to Candidacy for the PhD Degree	26
Dissertation Defense	27
Masters Degree	27
Requirements for an MS Degree	27
Responsibilities of the Student	28

Requirements to maintain good standing in Program	28
Teaching: TAs and Teaching Minor Program	29
Teaching Assistants	29
Training	29
Workload	30
Monitoring	30
Courses	30
Teaching Minor Program	30
Enrollment	30
Requirements	31
Continuation in the Teaching Minor Program	32
Completion of the Teaching Minor Requirements	32
Suggested Timeline for the Teaching Minor	32
Financial Support and Benefits	33
Sources of Support	33
Fellowships	33
Grants awarded to Dissertation Advisors	33
Teaching Assistantships and Fellowships	33
Healthcare and Tuition	34
A&S Fellows, TA/TFs, GSRs and Mellon fellows	34
Other Fellowships	34
University Health Plans	34
Travel Grants	35
Conflict Resolution and Leaves of Absence & Readmission	35
Conflict Resolution	35
Leave of Absence	35
Readmission	36
Requirements for readmission	36
Appendix A: Overview of Requirements for EE Program	37
Appendix B: Overview of Requirements for MCDB Program	38
Appendix C: Graduate Courses Offered	39
Appendix D: Preapproved courses outside Biological Sciences	40
Appendix E: Instructions for Application via the Direct Entry method	41
Appendix F: Undergraduate that require TAs	43
Appendix G: Current Stipend Rates	44

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

- (1) **Standard Level Entry (SLE)**. Most students who are accepted into the MCDB or EE graduate program have a BS as their most advanced degree and enter by the SLE method as described on the website. SLE students commence their studies at the beginning of the first year and, although EE students may have initiated a dialog with a faculty member, students join the program in August without having identified a faculty advisor and only do so in late April having completed two or three research rotations and the required first year course work. Traditionally SLE students are supported in their first two semesters by a fellowship from the Dietrich School of Arts and Sciences.
- (2) **Advanced Level Entry (ALE)**. This method allows students who have completed a Masters degree or equivalent to join either program; these students must have performed research and course work equivalent to that experienced by first year students in our own programs. Consequently, ALE students will have most of the requirements for the first year waived and will join a lab directly, having identified a Dissertation Advisor prior to applying to a program. ALE students are not eligible for support by the Dietrich School of Arts and Sciences first year fellowships. More information on entry vial the ALE method can be found in [Appendix E](#).

Programs of Graduate Study

There are two Programs of Graduate Study in Biological Sciences, which operate with similar mechanisms for admission, advice and guidance, first year courses, research rotations, teaching requirements and dissertation research.

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

Features unique to each program are noted in the **Graduate Program Requirements** section below. A **Teaching Minor** is also available to all students in our Department (see below).

Graduate Program Faculty

Students may pursue their degree within the MCDB or EE graduate program in one of the following laboratories within the Department of Biological Sciences:

Research Mentor Within the Department		Area of Expertise
Karen Arndt	Professor	Gene expression
Tia-Lynn Ashman	Professor	Evolutionary ecology
Andrea Berman	Assistant Professor	Telomere Molecular Biology
Jon Boyle	Associate Professor	<i>Toxoplasma</i> pathogenesis
Jeffrey Brodsky	Professor	Protein quality control
Gerard Campbell	Associate Professor	<i>Drosophila</i> development
Anne Carlson	Assistant Professor	Fertilization and channels
Walter Carson	Associate Professor	Tropical forest ecology
Deborah Chapman	Associate Professor	Mouse development
Paula Grabowski	Professor and Chair	mRNA splicing
Graham Hatfull	Professor	Phages and tuberculosis
Roger Hendrix	Distinguished Professor	Bacteriophage biology
Jeffrey Hildebrand	Associate Professor	Cell morphology
Lewis Jacobson	Professor	Signal transduction
Kirill Kiselyov	Associate Professor	Ion channel function
Jeffrey Lawrence	Professor	Genome evolution
Miler Lee	Assistant Professor	Zebrafish development
Nathan Morehouse	Assistant Professor	Evolution of coloration
Craig Peebles	Professor	mRNA splicing
James Pipas	Professor	Viral tumorigenesis
Jonathan Pruitt	Associate Professor	Behavioral ecology
Mark Rebeiz	Assistant Professor	Evolutionary biology
Cori Richards-Zawacki	Associate Professor	Evolutionary and behavioral ecology
John Rosenberg	Professor	Structural biology
William Saunders	Associate Professor	Cancer cell division
Anthony Schwacha	Associate Professor	DNA replication
Andrew VanDemark	Associate Professor	Structural biology

Your choice of faculty mentor is not constrained by the graduate program (EE or MCDB) into which you matriculated.

Departmental Website

We maintain a current and easy to use website with information about our Graduate Programs, Faculty research interests (<http://www.biology.pitt.edu/all-faculty>), and policies for admission to potential applicants at: <http://www.biology.pitt.edu/>. The website is also useful for Department members, providing news and highlighting upcoming events. The *Guide to Graduate Studies* is revised and issued yearly. Information within this *Guide* may be superseded by information that is posted to the Departmental web site.

Additional information on graduate study is available at the University of Pittsburgh Regulations Governing Graduate Study website:
<http://www.pitt.edu/~graduate/regtoc.html>

Departmental Graduate Committees

Director of Graduate Studies (DGS)	<i>Karen Arndt</i>
Graduate Program Administrator (GPA)	<i>Cathy Barr</i>
Graduate Program Oversight Committee	<i>Karen Arndt (Chair)</i> <i>Jeffrey Lawrence</i> <i>Jim Pipas</i> <i>Jeff Hildebrand</i> <i>Tony Schwacha</i> <i>Valerie Oke</i>
Graduate Fellowship and Awards	<i>Jim Pipas (Chair)</i> <i>Roger Hendrix</i> <i>Jonathan Pruitt</i>
Graduate Recruiting and Admissions	<i>Jeff Hildebrand (Chair)</i> <i>Jeff Brodsky</i> <i>Walt Carson</i> <i>Mark Rebeiz</i> <i>Anne Carlson</i> <i>Chris Guerriero</i>
Graduate Curriculum & Assessment	<i>Tony Schwacha (Chair)</i> <i>Gerard Campbell</i> <i>Nate Morehouse</i> <i>Roger Hendrix</i> <i>Andrea Berman</i>
TA Oversight	<i>Valerie Oke (Chair)</i> <i>Sam Donovan</i>

Graduate Committee 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 duties assigned to GPOC, as described below, are 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 Committee (GRAC)

The primary goal of GRAC is to solicit applicants for graduate study and to recruit prospective students. The Chair of GRAC 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 GPA to ensure that the application information and pertinent data on incoming students is communicated to the Dietrich School Arts and Sciences.

Graduate Fellowships and Awards Committee (GFAC)

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

- Write and submit applications for graduate student training grants.
- Coordinate the submission of promising grant proposals arising from BIOSC 2055 *Communication in the Biological Sciences* courses.
- Solicit nominations and forward top-ranked applications for Andrew Mellon Fellowships to the Dietrich 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 & Assessment Committee (GCAC)

The GCAC coordinates the curriculum requirements for both the MCDB and EE programs. The Chair of GCAC reports to the DGS. Duties of GCAC include:

- Coordinate content and scope of graduate course offerings.
- Coordinate with the Chair and Associate Chair in staffing these courses.
- Monitor progress and proposed changes to graduate courses.
- Evaluate the effectiveness of the curriculum through student and faculty feedback.
- Recommend the addition and removal of courses so that the curriculum meets current Departmental needs.

TA Oversight Committee (TAOC)

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

- Coordinate assignment of Teaching Assistantships.
- Administer the Teaching Minor Program
- 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.

Graduate Student Advising System

Advising in the First Year

General Orientation Meeting

During the week prior to the start of the Fall term, a General 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. Students are also given a tour of Departmental research facilities and introduced to the resources available at the integrated Langley Library. When appropriate, international students are evaluated for English language proficiency.

Graduate Student Mentoring Committee

Also during Orientation week, students will meet with the Graduate Student Mentoring Committee. Here, questions regarding each student's individual curriculum may be discussed including the scope and content of graduate courses, preparation for graduate-level coursework, or integration of coursework and research within their first two years.

Interim Advisor

First year graduate students in the MCDB and EE programs 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 student's 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.

Advising in the Second Year and Beyond

Dissertation Advisor

At the end of the Spring semester 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.

Under unusual circumstances, students may perform their dissertation research under the guidance of a mentor from outside the Department of Biological Sciences. In these cases, a co-mentor from within the Department must be a member of the student's dissertation committee. Outside mentors must be approved by the Department Chair.

Dissertation Committee

Purpose

To provide feedback and expertise in topics related to the development of the dissertation project. The committee participates in Annual Meetings, the Comprehensive Exam, Overview Meeting and Dissertation Defense Meeting.

Membership

- Faculty Advisor
- Three faculty members from the Department of Biological Sciences (adjunct faculty members can serve *only* if they are also members of Pitt Graduate Faculty, see below). One of these faculty members will be chosen to act as Chair of the committee (who will, thus, be someone other than the Faculty Advisor); this choice will be made by the DGS. Students may indicate a preference for their committee chair, although it is not always possible to accommodate these requests. The Dietrich School policy is that committee members who leave the university after a graduate student has been admitted to candidacy may stay on the committee in their original capacity, be it as an internal/external member, as long as they are willing and able to physically attend the defense, and providing that the defense is scheduled within 12 months of the faculty member's departure. The only exception to this rule is if the departed committee

member is the faculty advisor, in which case a co-advisor from the department must be designated. If a committee member retires, they may remain on the committee as long as they are still willing to serve, and are still active professionally in the academic community.

- Members of the Departmental Adjunct Faculty may serve as Departmental members only if they have Pitt Graduate Faculty status; however, each student's committee is limited to a maximum of one Adjunct faculty member as a Departmental member of the committee. Additional Adjunct faculty may serve as outside members (see below). If a graduate faculty member has a primary appointment in one department and a secondary or joint appointment in another department, s/he may serve as either an internal or external committee member. S/he may also serve as a chair or co-chair of the committee.
- One outside faculty 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. Note: if the outside faculty member is not a member of the University of Pittsburgh Graduate Faculty (including School of Medicine faculty - a list of the University's Graduate Faculty is available online at www.ir.pitt.edu/gradfac/homepg.htm), then s/he must be approved in advance by the Assistant Dean of Graduate Studies. Approval cannot be taken for granted: to be approved they must have the equivalence of graduate faculty status at another institution, and must have some experience of teaching and mentoring at the graduate level, including previous experience on Ph.D. Dissertation Committees. Consequently, it is important to be sure that a potential outside member meets these requirements before requesting permission. The best course of action is for the Advisor and student to ask a potential outside member if they would be willing to act in this capacity, but also inform them that if they do agree then for official approval they must meet the university requirements outlined above and need to provide a C.V. that includes details of this, including lists of any recent courses taught at the graduate level, graduate students mentored, and graduate student committees on which they have served as well as past and present positions and a list of publications. It is the responsibility of the Dissertation Advisor to obtain final approval: e-mail a letter of request to Jennifer Roethlein, Student Service Coordinator, Dietrich School of Arts and Sciences Graduate Studies Office (jer126@pitt.edu) include a C.V. and in your letter justifying the choice. Note: requests for external members must be approved by the Assistant Dean in advance of the requested member's participation on the doctoral committee. The Assistant Dean will review the material and either approve or reject the proposed external member. A graduate faculty member from another school or University, who has been approved by the Assistant Dean, may serve as a co-chair of a dissertation committee. If the Assistant Dean approves the outside member, the Dissertation Advisor must forward this e-mail to the DGS and the GPA. Also note: the Dean's office will not provide funds to bring in outside faculty members for any meeting or defense. The possibility of acquiring Departmental funds for the visit of an outside member for a defense should be discussed with the Chair of the Department well in advance; this may be possible if the visit is coupled to a Departmental seminar. The outside committee member must attend the Overview Meeting and the Defense and is encouraged to attend all other meetings. If the outside member cannot attend the Overview Meeting, a petition should be made to the Graduate Dean's office for a waiver (contact Jennifer Roethlein (jer126@pitt.edu) directly and relay the response to the DGS or contact the DGS who will initiate the process on your behalf; there is no guarantee this will be granted but accommodation has been made in the past if assurance is given that the outside member will definitely be present at the Defense.

- The Dissertation Committee often serves as the Examination Committee for the comprehensive exam. The Outside committee member does not attend the comprehensive exam.
- The committee can include additional members if desired. 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.

Choosing Committee Members

- Near the beginning of the second year in the Program, student and Faculty Advisor invite faculty members from the department to serve on the Dissertation Committee. The outside member can be invited at this stage, but can be asked later; an outside member must have agreed to act on the committee before the Overview meeting.
- Committee composition should be reported to the DGS and the GPA by email as soon as the Departmental members have been identified and then later when the outside member has been chosen; if required, provide evidence of pre-approval from the Graduate Dean for the outside member (see above).

Changes to your Thesis Committee

Any changes to the committee after the thesis proposal/prospectus/overview meeting must be approved by the Assistant Dean before the defense. Forms for admission to candidacy and committee changes can be obtained in 5141 Sennott Square or from the GPA. Any changes to the membership of the Dissertation Committee should be approved first by the DGS and then by the Chair of the Department who will forward any requests to the Assistant Dean for Graduate Studies who will provide final approval. To this end, requests for changes in membership should be made by the Chair of the Dissertation Committee in an e-mail to the DGS. In the e-mail the reasons for any changes should be outlined and it should be confirmed that all present and proposed future members of the committee are in agreement with the new committee membership.

Annual Committee Meetings

Beginning in the second year and every year until graduation, students are required to hold a meeting with their dissertation committee at least once a year; it is convenient to do this soon after the student's Annual Seminar Presentation. The meeting must be attended by the Faculty Advisor and the three Biological Sciences faculty; the outside member is encouraged to attend, but this is not mandatory. These meetings serve as an opportunity for the student to gain feedback and insight from committee members as the student develops his or her dissertation research and for the committee to evaluate the student's progress towards our Program requirements.

Note: All committee members are required to be physically present at both the thesis proposal/prospectus/overview meeting and the defense. In special circumstances, a committee member may request to participate via videoconferencing at either the overview or defense, but cannot participate remotely in both. Only the Assistant Dean can approve a remote participation from one of the two required meetings (overview or defense).

Each year, the date and time of the meeting is initially scheduled for 1 pm on the same day as the student's research seminar (MCDB on Friday, EE on Wednesday). It is the responsibility of the student to inform the committee of the date of the seminar several weeks in advance and to remind the committee that the annual meeting will be held after the seminar. The time and date of the meeting can be changed if one or more of the

committee cannot attend after the seminar, but GPOC must be informed of the change via email to the DGS and the GPA.

Prior to each annual committee meeting, the student must complete a Student Annual Report form (available from the GPA and the Department website) and compose a 3-5 page report updating their progress since the last meeting (including figures/graphs). These must be forwarded to each committee member at least one week before the meeting.

At the end of the meeting the committee members will provide the student with an assessment of their:

- General knowledge in MCDB or EE
- Expertise in their chosen area of specialization
- Ability to design, execute and interpret experiments
- Ability to communicate scientific findings in writing and orally (including a report on their research seminar and their written summary of research)

The Committee Chair will complete an Annual Committee Meeting form (available from the GPA and Department website) detailing this assessment and following approval by the rest of the committee, will forward an electronic copy to the Graduate Program Administrator. (Note that in the beginning of the second year, the DGS may have yet to assign the Committee Chair, as s/he awaits committee information from all of the 2nd year students. In that case, the Dissertation Advisor has the responsibility of filling out the Meeting form. In all other cases, this is the duty of the Committee Chair.) Copies will be given to the student, all committee members and the DGS. It is also the duty of the committee to review student compliance with course requirements and inform GPOC if the student has failed to complete a requirement in the stated timeframe.

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 (see below).

Graduate Program Requirements

University Requirements for the PhD Degree

The requirements specified in this guide regarding the requirements for being awarded a Ph.D. from the University of Pittsburgh in the EE or MCDB Program include requirements specific to each program and all requirements that have been specified for all PhD programs in the University. The latter can be viewed on line in the document *Regulations pertaining to the Doctor of Philosophy*: <http://www.pitt.edu/~graduate/regphd.html>.

Programmatic Requirements for the PhD Degree

Listed here are the requirements that must be fulfilled to earn a PhD in the EE or MCDB program in the Department of Biological Sciences. Where appropriate, each is described in depth below.

- **Graduate courses:** A total of 8 credits in formal graduate coursework (e.g., four 2-credit courses) must be completed within the first two years. At least half of this requirement should be fulfilled in the first year.
- **Graduate Seminar Courses:** Two are required within the first two years, with at least one to be completed in the first year.
- **Graduate Communications Workshops:** Three are required, one (*Grants*) to be completed within the first year.
- **Research Rotations:** In first year, three rotations are required (HMBP and ALE students excepted). For MCDB students, all three must take place in different laboratories; for EE student, they must be performed in at least two different laboratories.
- **Maintaining GPA above 3.0.**
- **Compliance with Research Ethics requirements**
- **Graduate Seminar attendance each week;** these seminars take place on Wednesday (for EE students) or Friday (for MCDB students) at noon.
- **Seminar presentation:** each year starting in the second year
- **Department Seminar attendance each week;** participation in the pre-seminar journal club during the first year
- **Attendance at Annual Department Retreat**
- **Successful Preliminary Evaluation:** at end of Spring semester of first year
- **Comprehensive Exam:** during the second year
- **Annual Committee meeting:** one of which must act as the Overview Meeting
- **Teaching:** One term of satisfactory performance as a Teaching Assistant is required some time after the first year.
- **Dissertation Research**
- **Dissertation Defense**

Graduate Courses

Graduate Courses Offered Within the Department

The Department runs a rotating series of graduate-level courses that are taken by our graduate students. A list of all the classes regularly run by the department can be found in [Appendix C](#); because changes may be made, it is recommended that students check that a course is being offered in any particular semester by consulting actual course listings on the Pitt website: http://www.registrar.pitt.edu/schedule_of_classes.html.

Students are required to complete 8 credits of formal coursework (that is, in addition to seminar courses and communications courses) within the first two years; at least half of these credits (2 courses) should be completed during the first year.

Graduate Courses Offered Outside the Department

It is also possible for students to take courses outside of the Department if these fulfill program requirements. 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 offered outside the Department that fulfill requirements toward students' degrees ([Appendix D](#)). If you are interested in taking a course outside the Department to fulfill a graduate course requirement toward your PhD that is not pre-approved, you must do the following:

1. Consult with your dissertation advisor about appropriate courses.
2. Check if the course is on the past-courses-approved-by-GPOC list ([Appendix C](#)).
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 dissertation 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.

Graduate Seminar Courses

Students must complete 2 terms of Graduate Seminar Class (BIOSC 2450 or BIOSC 2540) within the first two years; it is strongly recommended that this be completed within the first year, if possible. Different sections of this class are offered each semester on different topics; students read and present current research articles guided by two faculty members. The goal is to teach the student critically to evaluate the research of other scientists and to communicate both the research and this evaluation in an oral presentation. A writing component may be incorporated to aid students in developing skills in scientific writing.

Graduate Communications Workshops

Three half-semester 1-credit sections of BIOSC 2055 are offered on a rotating basis that cover all aspects of communication: (a) grant proposals, (b) manuscript preparation for journal articles and book chapters, and (c) posters, seminars and outreach lectures. These workshop-style courses reinforce critical thinking and increase writing skills necessary for publication and other modes of scientific communication through faculty and peer critique of students' written pieces or oral presentations.

Students are required to take each of the three sections, and are encouraged to re-enroll in the workshops throughout their graduate career to increase their productivity (*Publications & Grants*) and build skills needed for a successful career in science.

It is very strongly recommended that students complete the *Grant Proposals* and *Posters and Presentations* workshops during the first year; these workshops will prepare students for writing their comprehensive exam and presenting seminars. Proposals generated during the *Grants* workshop may be submitted to appropriate funding agencies for consideration for funding.

Research Rotations

Students in both the MCDB and EE 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.

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.

Rotations must consist of scientific research undertaken by the student, including the formation of specific hypotheses, design of experiments to test these hypotheses, and interpretation of the results. Rotation projects cannot consist solely of a literature review, or the preparation of a research paper or grant application.

Each rotation will be graded (letter grade) and is worth 1 credit. A minimum average grade of B- (2.75) is required for the first three rotations; any student with a grade below this will not be promoted to the second year. Dates for the research rotations in the 2015-16 academic year are as follows:

Rotation	Start	Finish	Rotation talk
First	Monday 31 Aug 2015	Friday 6 Nov 2015	Friday 6 Nov 2015
Second	Monday 9 Nov 2015	Friday 5 Feb 2016	Friday 5 Feb 2016
Third	Monday 8 Feb 2016	Friday 22 Apr 2016	Friday 22 Apr 2016

Rotation Presentation Guidelines

Short (15 minute), oral presentations are required at the end of each rotation (dates indicated above). The purpose of the rotation presentation is to *concisely* describe what

research question or 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 strongly recommended. As in other facets of graduate work, it is expected that students will strive for excellence in their presentation.

Rotation advisors will provide a written report of the student's rotation performance to GPOC. Student performance will be discussed at the Faculty meeting at the end of the Spring semester as part of the Preliminary Evaluation.

Overall Graduate GPA

Students are expected to maintain a GPA at or above 3.0 during their entire tenure. If a student's GPA falls below 3.0, they are automatically placed on academic probation by the Dietrich School of Arts and Sciences. It is expected that the student's GPA will rise to 3.0 or above within one semester. Failure to do so may result in the student's discharge from the PhD program.

Research Ethics

Training in the ethical performance of scientific research comprises three components.

On-line training in Research Integrity

First, all first year students must also complete an on-line ethics course before they can begin their studies. The course covers: (1) Data, (2) Mentoring and Authorship Practices, (3) Research Misconduct, (4) Ethical Issues for TAs and (5) Some Examples of Findings of Research Misconduct. To take the course, students must first register at:

<https://www.hsconnect.pitt.edu/HSC/home/create-account.do>

Then go to:

<https://cme.hs.pitt.edu/servlet/IteachControllerServlet?actiontotake=loadmodule&moduleid=4981>

When the course has been passed, a print out of the certificate must be given to the Graduate Program Administrator.

This requirement must be completed by the Friday of the week before classes start.

Students failing to complete this requirement will not be eligible to register; continued failure to complete this requirement is grounds for dismissal from the program.

In addition, individuals conducting or involved with Human Subject Research must complete additional training in research ethics provided by the *Collaborative Institutional Training Initiative* (CITI) to satisfy IRB training requirements. For further information please visit <https://www.citi.pitt.edu/citi/about.aspx>.

Students must also review The University of Pittsburgh 'Guidelines for Responsible Conduct of Research' which are published on-line:

<http://www.pitt.edu/~provost/ethresearch.html>

The University policy on Research Integrity is published in *Policies, Procedures and Handbooks*: <http://www.bc.pitt.edu/policies/>

The relevant section (11-01-01) can be found at:

<http://www.bc.pitt.edu/policies/policy/11/11-01-01.html>

This outlines the steps that will be taken in any cases of misconduct and student's rights.

Workshop in scientific Ethics

All first year students must successfully complete the Departmental workshop in the ethical performance of scientific research, Biosc 2058, which is offered in the fall semester. Failure to complete this requirement with a grade of B⁻ (2.75) or better will prevent promotion to the second year.

Prevention of Sexual Harassment

All graduate students are required to complete the University's online course on the prevention of sexual harassment. The online training module called "*Preventing Discrimination and Sexual Violence: Title IX, VAWA, and the Clery Act*". Each student will receive a customized link to complete the course, in an email from **Workplace Answers eLearning** with the subject line "Preventing Discrimination and Sexual Violence: Title IX, VAWA, and the Clery Act." Alternatively, students who do not receive the email can access the training module on my.pitt.edu. They should go to My Resources/Human Resources and look on the left side, under the green button for "Preventing Discrimination and Sexual Violence: Title IX." The certificate awarded upon successful completion of the course must be printed out and a copy given to the Graduate Program Administrator, who will notify the Office of the Provost. **Incoming students are advised to complete this training module by Friday of the week before classes start.**

Also, it is the responsibility of each student to take timely action when allegations of harassment or sexual harassment come to their attention.

Copies of all University policies related to sexual harassment (Policy 07-06-04), faculty-student relationships (Policy 02-04-03), and nondiscrimination (Policy 07-01-03) as well as the nondiscrimination and anti-harassment procedure (Procedure 07-01-03) may be found online at <http://www.bc.pitt.edu/policies/>.

Graduate Research Seminar

Seminar Attendance

Graduate Student Research Seminars are presented twice a week by graduate students within the Department. Students in the EE program typically present Wednesday at noon in the EE seminar series; students in the MCDB, MVM, MGDB, CB, PIMB and other programs typically present on Friday at noon. Students are expected to attend at least one of these seminars weekly beginning in the first year.

Seminar Presentation

Beginning in the second year, each student must present annually a seminar of their research in progress (proposed projects, recent data, and experimental problems) to faculty, students, post-docs and other interested members of the Department. Students in their first year who matriculate into their dissertation laboratory (e.g., ALE students or HMBP students opting out of rotations), will present a seminar in the noon seminar series as well.

All members of the Dissertation Committee should be present and provide the student with feedback; an assessment of the student's performance should be included in the report for the Annual Committee Meeting. As described above, this meeting is scheduled

to begin immediately after the Annual Seminar Presentation, although the time and date can be changed prior to their seminar by informing the DGS and the GPA of the new time and date.

Seminar Guidelines

Presentations should be about 35 minutes long. Questions, comments, criticisms and suggestions from the audience are encouraged during and after the seminar. After the seminar all graduate students participate in an informal feedback session in the absence of faculty.

One week prior to the seminar, the student must prepare a 250-word abstract of her/his dissertation work and send this to the seminar coordinator, who will distribute it to other members of the Department. A list of speakers is circulated in advance.

All graduate students in the first year and beyond are expected to attend each and every Friday (MCDB students) or Wednesday (EE Students) noon seminar, and to participate in the informal feedback sessions. Attendance will be monitored.

Departmental Seminar

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.

First year students also participate in the pre-seminar journal club. Here, members of the host laboratory review publications from that week's speaker. This journal club serves to familiarize students with the subject matter before the seminar.

Departmental Retreat

The annual Departmental Retreat, usually held at the Pymatuning Laboratory of Ecology in late September, offers an opportunity for first-year students to meet Faculty, postdoctoral researchers, fellow graduate students and other members of the Department. 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 the second year skit!

This year, the retreat will be held 18-20 September 2015. All students are expected to attend and must register on-line.

Teaching

All students are required to teach for one term as a Teaching Assistant. More information on this and the Teaching Minor Program are presented in a later section.

Dissertation Research

Dissertation research commences when the Dissertation Advisor is chosen and continues at least until the Dissertation Committee (see below) agrees that an acceptable body of work has been completed to prepare the dissertation. As described below, 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.

Training Milestones and Statutes of Limitations

As outlined by the Dietrich School of Arts and Sciences, students must complete their work and graduate within a specified time frame. These statutes of limitations are defined as follows:

Degree		Maximum time until graduation	Validity of comprehensive exam
On entry	Sought		
BS/BA	PhD	10 years	7 years
MS	PhD	8 years	7 years
BS	MS	4 years	4 years

If the statute elapses for the comprehensive exam, the exam must be retaken. Students should ensure completion of their degree by reaching important milestones in the recommended time frame. Milestones are outlined below for students entering without an MS degree; students entering with an MS are expected for finish somewhat earlier.

Training Milestone	Year 1			Year 2			Year 3			Year 4			Year 5			Year 6			Year 7			
	F	S	Su	F	S	Su	F	S	Su	F	S	Su	F	S	Su	F	S	Su	F	S	Su	
First Apply for Fellowships	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Red													
Complete Laboratory Rotations		Green	Yellow	Yellow	Red																	
First Committee Meeting			Green	Green	Yellow	Yellow	Red															
Complete Coursework			Green	Green	Yellow	Yellow	Red															
Comprehensive Exam			Green	Green	Yellow	Yellow	Red															
Second Committee Meeting					Green	Green	Yellow	Yellow	Red													
Overview Meeting					Green	Green	Yellow	Yellow	Red													
Apply for Candidacy							Green	Green	Green	Yellow	Yellow	Red										
Third Committee Meeting								Green	Green	Yellow	Yellow	Red										
Fourth Committee Meeting											Green	Green	Yellow	Yellow	Red							
Thesis Defense												Green	Green	Green	Yellow	Red						

Green	On target for timely completion of the degree
Yellow	Running the potential to delay completion of the degree
Red	Problematically late

Committees, Exams and Meetings

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 EE or MCDB Programs are detailed in subsequent sections.

Preliminary Evaluation: 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 Spring semester of the first

year, each graduate student's performance in coursework and rotations is discussed at a special faculty meeting; at the end of the meeting the faculty vote to recommend promotion or dismissal of each student.

Promotion to the second year requires the following

- A positive vote from the faculty in the meeting. Faculty votes that fail to reach a supermajority (2/3 of the voting graduate faculty) are considered ambiguous and final decisions will be made by GPOC.
- A GPA above 3.0. This is a University requirement: all students must maintain a GPA above 3.0 to remain a graduate student at the University of Pittsburgh.
- An average grade in rotations of B⁻ (2.75) or above.
- Completion of the on-line course in Research Integrity and the Workshop in Ethical Performance of Scientific Research.
- Agreement from a faculty member to act as dissertation advisor.
- Approval from the Dean; this is routine if the above requirements are met.

Probation after Preliminary Evaluation/First Year Review

Any student who has a GPA below 3.0 at the end of the Spring semester may be placed on probation during the summer but only if they: (i) receive a positive vote from the faculty (see criteria above); (ii) have identified a faculty member to act as their dissertation advisor; (iii) have a GPA high enough that it could potentially be improved to 3.0 or above by grades awarded for available credits (3) in the summer. It is advisable that students do not plan any extended vacation or absences for any other reason during the summer as this will make them ineligible for probation.

During the summer, students placed on probation will be given the opportunity to improve their GPA to 3.0 or above; if this is achieved, they will be promoted. The following procedure will be followed:

- Students will be registered for research for credit (3 credits)
- GPOC will assign another faculty member as a Co-advisor
- The student will have a preliminary meeting with Dissertation Advisor and Co-Advisor to plan a program of research for the summer. The advisors will also set a Writing Assignment to be produced by the end of the summer that will include a documentation of the research conducted but may include additional tasks.
- The student will then write a brief one page summary of these goals and present it to both advisors.
- The student will meet at least once a month with both advisors to discuss research progress.
- Before the end of June, the student will arrange for a Probation Seminar to be held in the first week of August (or last week of July if that is not possible) to be attended by both advisors and at least one other member of GPOC (if possible other faculty should be invited and any other member of the department can also attend).
- At least three days before the Probation Seminar, the student will provide faculty that are attending the meeting with a copy of the Writing Assignment.
- Guidelines for the Probation Seminar are similar to those described above for Rotation Talks (although the advisors may make specific recommendations to the student as to what they should cover).
- The student will receive a grade based on the performance in the Probation Seminar and the quality of the Written Assignment. Any faculty present at the

Probation Seminar will meet immediately after this has finished and decide on the grade to be awarded to the student.

- The student will be informed of the grade by the GPOC member and whether this is sufficient to increase their GPA to 3.0 and consequently whether they will be promoted to second year or not.
- In the rare situations where a student with a GPA above 3.0 and with a positive vote from faculty has not identified a faculty advisor, they will be given the opportunity to find a lab to do a fourth rotation.

A student will be dismissed from the program if:

- At the end of the Spring semester, their GPA is so low that it could not be increased to at least 3.0 by the end of the summer even if they achieved an A grade (4.0) in the available 3 credits.
- They have a GPA below 3.0 following one term (summer, fall or spring) on probation.
- They receive a negative vote from the faculty upon evaluation. Achieving a GPA of 3.0 does not guarantee promotion; the faculty judges other factors, including research performance, when considering promotion to the second year.
- They have failed to identify a faculty member who will act as their Dissertation Advisor.

Comprehensive Exam

The Comprehensive Examination is designed to assess the student's mastery of the general field of doctoral study, the 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 to design and interpret experiments. The Comprehensive Exam must be completed by the end of the second year, around the time of the completion of the formal course requirements. The exam must be attended by the three Biological Sciences members of the student's Dissertation Committee. The MCDB advisor does not attend the exam; for EE comprehensive exams, the Dissertation Advisor may be invited to attend and ask questions only after the other Committee members have finished their examination of the student. The Chair of the Dissertation Committee will also chair the exam.

The exam must be attended by three faculty who are members of the University of Pittsburgh Graduate Faculty (<http://www.ir.pitt.edu/homepg.php>). In the unusual situation where this is not the case (generally only when one of the faculty has joined the department only very recently), an additional faculty member who is a member of the graduate faculty should be asked to join the exam committee; this additional member need not officially join the Dissertation Committee. The committee member who does not have Graduate Faculty Status can and should participate in the exam. Outside committee members **do not** participate in comprehensive exams.

Timing of the exam

The comprehensive exam must be completed by the end of the spring semester of the student's second year.

Scope of the exam

The student may be examined orally in topic areas suggested previously by the Committee as well as in general knowledge of in Ecology and Evolution (EE students) or Molecular, Cellular and Developmental Biology (for MCDB) as appropriate. Students should contact their mentors and members of their committee well ahead of the exam to determine which, if any, specific topic areas will be considered.

Format of the written proposal

Students are required to write and submit a grant proposal to their dissertation Committee **at least two weeks** prior to the date of their comprehensive exam. **The proposal should be limited to 15 written pages, not including references.**

Students should submit an NSF- or NIH- style grant proposal. Proposal guidelines can be found at the NSF website:

<http://www.nsf.gov/pubs/policydocs/papp/index.jsp> See Part I. Grant Proposal Guide.

General procedure for the examination

The student will prepare the written proposal prior to the exam and schedule an oral examination after consultation with members of the committee; the student must inform the DGS and the GPA of the time, date and location of the examination. The student must also bring to the examination a university report card (obtained from the Graduate Program Administrator) that must be completed by the committee (if a reexamination is necessary this University report card should be completed then, not at the initial exam). The examination will begin with a short presentation from the student covering all the major points of the written proposal. The committee members will then orally examine a student testing their expertise in the chosen field and also their general knowledge in EE or MCDB.

General Advice on the proposal

- Begin with a clear introduction, providing the relevant facts to someone not an expert in this field and pose specific question(s) that remain to be answered.
- Justify why you have chosen a particular experimental system to address these questions. What alternatives could have been chosen?
- Present hypotheses that will be tested to address those questions; provide possible alternative hypotheses.
- List two or three specific aims.
- Within each specific aim, describe experimental approaches to address that aim and which will test one or more of the hypotheses you have proposed.
- Explain what the results will be if your hypotheses are correct. What alternative results could be obtained and will these refute your hypotheses; would they support your alternative hypotheses?
- For each experimental approach you have chosen: justify why you have chosen that approach, describe what potential problems you might encounter and suggest alternative approaches that could be taken if these difficulties do occur. Has anyone ever used the approach you propose in the experimental system you have chosen? If not, justify why you expect this approach to work. Make sure you know the theory behind all of the experimental techniques you propose to use. Be aware of the advantages of each approach and the disadvantages. Some details are important, in particular those that relate to feasibility, *e.g.*, how much tissue you do need for an experiment? Are the reagents you need to use readily available; if not how will you generate them?
- Make sure you provide references for all the statements you make and to support all the experimental approaches you propose to use.

The role of the Dissertation Advisor

Although the Dissertation Advisor is the primary mentor for the student, they should not have any direct input into the preparation and writing of the proposal that forms part of the examination: this written document should be the work of the student alone. The

Advisor will already have had significant influence on the ability of the student to provide an acceptable document for the comprehensive exam, via their mentoring of the student. The student is expected to discuss the report they receive after their examination with their Advisor, but if reexamination is required, the Advisor cannot read and directly comment on the written proposal or on a revised proposal.

Peer review

The formulation of hypotheses and experimental design should originate with the student, so substantial discussion with any other individual during the writing process must be avoided. However, it is strongly advised that students review each other's proposals after they have been written. This review should be restricted to students within our program and not extend to post-docs or other professionals.

Decision

At the end of the oral exam the student will be asked to leave the room. The Committee will discuss the performance of the student in the oral exam and the quality of the written document; each member will then vote: pass unconditional, pass conditional or fail. For an unconditional pass, support must be unanimous. To vote for a conditional pass, a member must be satisfied that the student has almost met the conditions necessary for a pass but has identified specific deficiencies that should be improved before a full pass is granted. If a conditional pass is the decision, the committee will then discuss what measures need to be taken by the student in order to pass; these could include rewriting part of the written document, with or without a second oral exam. If the decision is fail, the committee will discuss exactly what the reasons are for the failure. When the committee has completed the voting and discussion, the student will be asked to reenter the room and the Chair of the committee will inform the student of the decision. The Chair will then provide the student with details on the reason for the decision. If the decision was unconditional pass then the committee should sign the University examination card and this should be completed by the Chair and handed to the Graduate Program Administrator. Immediately after the meeting the Chair must inform the Dissertation Advisor (MCDB), the DGS and the GPA of the decision by e-mail.

The decision of the committee should be unanimous; if a unanimous decision cannot be reached, the DGS will mediate and reach a final decision.

Report

Within one week of the oral examination the Chair of the committee will complete a detailed Departmental report. This must be completed in consultation with the other members of the committee and will provide an evaluation of the written proposal and oral exam. If the student was not awarded an unconditional pass, the report will outline the areas that the student must improve or correct in order to pass the comprehensive exam. If the decision was a conditional pass, the specific requirements that need to be reexamined must be clearly documented in the report. If the decision was fail, then the specific reasons for this must be provided. The report must be e-mailed to the student, the other members of the committee, the DGS, the GPA and the Dissertation Advisor. The student is expected to discuss the report with members of the committee; this is essential if the student did not receive an unconditional pass.

Reexamination

If a student receives a conditional pass or a fail then they can request a reexamination. The distinction between the conditional pass and a fail is that for the former, the reexamination will only involve specific requirements (as decided by the committee after

the first examination), whereas for the latter the student must go through the whole procedure again, *i.e.*, produce a full revised written document and have a full oral examination. A conditional pass granted after the first examination does not guarantee that the student will pass the reexamination. Any reexamination must occur within three months of the original examination (unless there are unusual circumstances and, if so, this must be discussed with the DGS), the student must schedule the reexamination and inform the GPA and the DGS of the date, time and location. It is recommended that the student receive mentoring from their committee during the resubmission process, but the proposal must still represent the student's own work.

The procedure for the reexamination will follow that for the initial one, with the exception that the Committee will vote pass or fail. If the decision is fail, then the Committee will reassess the performance of the student and render another decision on whether they agree that the student's performance in the exam reaches that expected for an MS student. If the performance was at the MS level then the student will be given the opportunity to petition GPOC for transfer to the MS track according to the rules found later in this guide. There is no guarantee that GPOC would agree to the request. As for the first exam, all decisions must be unanimous, and if this cannot be reached the DGS will mediate and reach a final decision.

At the end of the examination, the committee members must sign the University examination card and this must be completed by the Chair and handed to the Graduate Program Administrator. Immediately after the meeting the Chair must inform the Dissertation Advisor (MCDB), the DGS and the GPA of the decision by e-mail. Within one week after a reexamination, the Chair of the committee will complete a revised report that includes an evaluation of the reexamination.

Overview Meeting and Admission to Candidacy for the PhD Degree

The Overview Meeting, sometimes called the Prospectus meeting, is designed to determine if a student has progressed sufficiently to be entered into candidacy for the doctoral degree. The meeting can be held any time after the comprehensive exam, but must be completed and an Admission to Candidacy form submitted at least eight months before a defense. The outside committee member and all other members must attend the overview meeting.

Each student must prepare a written dissertation proposal for presentation to the doctoral committee at a formal Dissertation Overview or Prospectus Meeting. The document will provide details on motivation, 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. If the Dissertation Committee unanimously approves the dissertation proposal, the student can file an application for admission to candidacy for the Doctor of Philosophy degree, if they have also successfully completed their comprehensive exam and required course work. All members of the committee must sign the Admission to Candidacy form.

It is appropriate to use one of the Annual Committee meetings as an Overview meeting. The student and Dissertation Advisor will discuss whether an upcoming Annual Committee meeting will be used as an Overview meeting (typically this would be in late third year or early fourth).

Dissertation Defense

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**. This two-week period is necessary for a complete evaluation of the written document, and respecting this time frame ensures the integrity of the University of Pittsburgh as a degree-granting institution. If the thesis cannot be provided 2 weeks in advance of the defense date or if the committee and GPOC conclude that the submitted thesis is indefensible, the defense should be rescheduled.

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/>). Walk-in support is also available at Hillman Library.

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 outside committee member must attend the defense.

Masters Degree

The Department of Biological Sciences does not offer a master's degree program in either MCDB or EE. However, if a student does not complete all the requirements for a PhD, they may petition the Graduate Program Oversight Committee (GPOC) to be allowed to apply for a Non-continuing Master of Sciences (MS) Degree. If granted by GPOC, the student will be granted an MS Degree upon completing specific requirements (see below), including the defense of a research thesis.

Requirements for an MS Degree

- Students must successfully complete the first two years of requirements for either the MCDB or EE programs. This includes formal course work, at least two Seminar courses, at least two Communications courses and the comprehensive exam. If a student fails the comprehensive exam, the exam committee must have decided that although the level of performance was not sufficient to pass at the PhD level, it was sufficient to pass at the MS level.
- Students must have a Dissertation Committee consisting of three members of Biological Sciences Faculty. An outside member is not required.
- Overall GPA must be at or above 3.0, grades in all courses must be at or above a B-, and at least 8 credits must be with a grade of B or higher.
- Before considering transfer to the Masters program, the student must discuss this possibility with their Thesis Advisor and with the other members of their Dissertation Committee. The Dissertation Advisor and the Chair of the Dissertation Committee should indicate their approval or disapproval of the request for transfer and indicate as such in an e-mail to the DGS. If either disapproves of the transfer the student must meet with the DGS to discuss their options.
- The student must petition GPOC in writing (e-mail is sufficient) for permission to transfer from the Ph.D. track. The petition must include the specific reason for the request. GPOC must approve the transfer.

- If the petition to transfer to the M.S. track is supported by GPOC, the student will meet with their advisor and then with their committee to discuss a plan of research.
- Within two months after transfer to the M.S. track the student will hold the equivalent of an overview meeting presenting a short 2-3 page thesis proposal to their committee.
- The student will conduct research and prepare a Dissertation according to University requirements, as described for a Ph.D. Dissertation.
- The Dissertation will be defended publicly before the department and the student will be examined orally by the Dissertation Committee.

Responsibilities of the Student

- *Students are expected to strive for excellence and operate with integrity in all aspects of their course work, research responsibilities and Departmental citizenship 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 Dietrich 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.*

Requirements for students to maintain good standing in the Program

- **Keep GPA above 3.0**
A GPA below 3.0 will preclude promotion to the second year. If a student's GPA falls below 3.0 after the first year they will automatically be placed on probation and will become ineligible to take the comprehensive exam, to be admitted to candidacy for the PhD degree, to receive teaching assistantships and will be subject to dismissal at the end of the following term. It is expected that students will exit academic probation after one semester by raising their GPA to 3.0 or above.
- **Have a Dissertation Advisor**
A student must have the support of a Dissertation Advisor to continue in the Graduate Program. If a student fails to get agreement from a faculty member to act as his or her Dissertation Advisor at the end of the Spring semester of their first year they must discuss their options with the DGS: in rare situations, a Dissertation Advisor in another department at Pitt may be chosen. The Department cannot guarantee support for a student whose mentor's primary appointment is outside the Department of Biological Sciences. If a student loses the support of their current Dissertation Advisor after the first year, they have the option to find an alternative advisor among the faculty within the Department. If one cannot be found they will be unable to continue in the program.
- **Demonstrate satisfactory progress toward the completion of their degree.**
Each student must complete all requirements for their Program in the timeframe specified in this Guide and show good progress in their research efforts towards

completion of their degree. If a Dissertation Advisor and/or a Dissertation Committee judge the progress of a student to be unsatisfactory they will discuss the problem with the student and with the DGS. If no immediate solution is evident the student will be informed in writing that their performance is below that deemed satisfactory, state what measures must be taken to rectify the situation and provide a timeline to achieve this. If appropriate measures are not taken by the student within this time period, GPOC will recommend the student be dismissed. This recommendation is forwarded to the Department Chair, who will render a final decision.

- **Demonstrate appropriate personal and ethical behavior**

Students are professional scientists and must behave as such in their interactions with all members of the university. They must display exemplary ethical behavior in all aspects of their studies. Students are expected to participate in training in research ethics, including attending the Biosc 2058 Workshop and completing on-line training in a timely fashion.

Teaching: TAs and Teaching Minor Program

Teaching is an essential element of graduate student training our department. Developing good teaching skills is important not only for those students hoping to continue in Academia but for all students because these skills are used in many situations outside of a formal classroom. By the time of graduation each student should have experienced numerous opportunities to improve their teaching performance. The most obvious teaching experience is that of a Teaching Assistant (TA) in an undergraduate class and every student must participate in this for one semester. Students will also gain experience presenting science through their Noon Seminars, and they should also have the opportunity to supervise undergraduate students conducting research in their lab

Teaching Assistants

One term of satisfactory performance as a TA is required some time after the first year. MCDB students typically begin teaching in the Fall Term of their second year or the Spring Term of their third year. EE students usually begin teaching either at the Pymatuning Field Station or the Oakland Campus during their first Summer Term in the graduate program.

Training

University

At the beginning of the Fall Term, The Center for Instructional Development and Distance Education (CIDDE) sponsors a New TA Orientation. All graduate students in the Department of Biological Sciences who are teaching at the university for the first time are required to attend. CIDDE has produced a handbook for TAs; it is recommended that new TAs read relevant sections from this before they start teaching. It can be downloaded at:

<http://www.cidde.pitt.edu/teaching-support/ta-services/ta-handbook-teaching-assistant-experience>

Departmental

TA training within the department occurs at the end of the Spring Term for students TAing for the first time during the Summer Term and at the beginning of the Fall Term for

students TAing for the first time during the Fall or Spring Terms. All new TAs in the Department of Biological Sciences are required to attend. The agenda includes an overview of the TA program, teaching strategies, safety issues, an overview of departmental majors, a discussion of ethical issues, and balancing teaching with research. Each graduate student then presents a brief “lecture” to an audience comprised of the TA Coordinator and fellow graduate student trainees. During the semester, the new TAs observe a senior TA’s laboratory or recitation session.

Workload

Even when students are teaching they still need to continue their studies towards a Ph.D. and are expected to spend no more than 20 hrs a week on average on their TA duties. Students who are having to spend more than this time on a regular basis should talk to their supervising faculty member and, if the issue cannot be resolved at this level, to the TA Coordinator or the TA Oversight Committee.

Monitoring

Each supervising faculty member will observe the TA(s) conducting a recitation or lab before the middle of the term and will fill out an evaluation form that will be forwarded to the TA Coordinator. If the faculty supervisor rates the TA’s overall performance satisfactorily, the student will be informed. In cases where the performance is unsatisfactory, the supervising faculty member and the TA Coordinator will inform the TA of the results and offer suggestions and resources to assist them in improving their teaching. At a later date in the term, to allow sufficient time for the TA to improve, a member of the TA Oversight Committee and the supervising faculty member will observe the TA and evaluate the instruction.

Courses

A list of courses can be found in [Appendix F](#). Most TAs either teach recitations that are associated with lecture classes in which the TA may cover problem sets or specific topics suggested by the Instructor or they teach laboratory classes in which the TA will help with preparing and running the lab. The exact nature of the TA experience will obviously vary from class to class. Students are asked for preferences on teaching assignments, although it is not always possible to match everyone to their top choices.

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 perform 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 members 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 dissertation is submitted to the student's Dissertation 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 dissertation. 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 term takes place in the second year of graduate school and the other takes place in the third or fourth year of graduate school.
- B. **Petitioning for enrollment.** This typically occurs 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.** Approach potential 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.** This should occur in four consecutive academic year semesters (fall or spring) after acceptance into the Teaching Minor Program.
- E. **Enrollment in FACDEV 2200.** Ideally this occurs 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 their second TA assignment.
- F. **Yearly submission of a Teaching Dossier to GPOC.** Dossiers should be submitted on the 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 final dossier is submitted in the first semester after completing the Teaching Minor requirements, but at the latest by the time that the dissertation is submitted to the student's Dissertation Committee.
- H. **Receipt of the Teaching Minor.** The teaching minor is conferred upon graduation.

Financial Support and Benefits

It is the goal of the Program to have every student supported by a stipend. This is true for the majority of our students, but the department cannot absolutely guarantee this.

Sources of Financial Support

Financial support to cover student stipends comes from three sources (note the stipend rate for A&S fellowships, GSRs and TA/TFs is not identical: see [Appendix G](#)):

Fellowships

Fellowship from the Dietrich School of Arts and Sciences

Support for the Fall and Spring semesters of the first year is provided by a fellowship from the University of Pittsburgh, School of Arts and Sciences. There are only a limited number of fellowships but in recent years all students have been supported by one; it is expected that this will continue in the future.

Other Fellowships

Students are encouraged to apply for competitive fellowships awarded locally or nationally. Examples include the Mellon Fellowship and the NSF Predoctoral Fellowship. Students on outside fellowships need to apply to Arts and Sciences for a tuition waiver; see the Graduate Program Administrator for details. If healthcare is not covered by the outside fellowship, students should discuss their options with the GPA and their Advisor.

Grants awarded to Dissertation Advisors

A Dissertation Advisor may use some of his/her grant support to cover a student's stipend. A student whose stipend is covered by one of their Advisor's grants is termed a Graduate Student Researcher (GSR).

Teaching Assistantships and Teaching Fellowships

Students may be supported by Teaching Assistantships (TA) or Teaching Fellowships (TF) awarded by Arts and Sciences. The TF award is slightly higher than that of a TA. To be appointed a TF rather than a TA, must have successfully completed at least one semester of teaching.

Requests to be awarded a TA/TF must be made by the student's Advisor to the TA Coordinator. The Department has a limited number of TA/TF slots provided by Arts and Sciences; there are more slots available in the Fall and Spring terms as compared to the Summer term. If more requests are made than TA/TFs are available (which is generally only a problem in the summer), the following criteria will be used to determine which students will be awarded a TA/TF: (i) whether the student has gone without full funding in a previous term, (ii) the number of semesters of teaching already completed by the student, and (iii) the number of students from an individual lab

making requests at the same time. It is important to note that recently we have had more requests for summer TA/TF positions than slots available. Therefore, if you do not have other funding available, it is important to plan ahead in case you do not have a full TA/TF position in the summer. During the summer most of the slots are 0.5 positions (apportioning the work among two students for a single TAship), which helps us distribute the money among all students if we are unable to provide a full TA/TF slot to everyone.

Healthcare and Tuition

A&S Fellows, TA/TFs, GSRs and Mellon fellows

First year students receiving an Arts and Sciences Fellowship Arts and Sciences Fellows, TA/TFs and GSRs have their tuition and healthcare covered by the University or from overheads charged to the Advisor's grant. Any student with an appointment as an A&S Fellow, a TA/TF or a GSR for the Fall and Spring semesters will continue to have their healthcare covered for the Summer even if they lose that appointment (but remain a student in good standing). Mellon Fellows must remain as such to have their healthcare covered in the Summer.

Other Fellowships

Students who are awarded an outside fellowship can apply to the Dean of Graduate Studies for funds to cover their tuition for the duration of the fellowship. Most outside fellowships will include funds for healthcare, but if this is not the case, the student should discuss their options with the GPA and their Advisor.

University Health Plans

All information on University health, dental and vision plans can be found at:

<http://www.hr.pitt.edu/benefits/student-be/graduate-s>

Although premiums for individual students in the UPMC Health Plan are covered for University fellows, TA/TFs and GSRs, students must make additional contributions to cover other family members. Additional monthly contributions are also required to join the vision and dental care plans.

The UPMC Health Plan description:

http://www.hr.pitt.edu/sites/default/files/uploads/student_benefits/Panther%20Blue%20-%20Graduate%20Student%20Plan.pdf

Students will be issued a UPMC medical card at the beginning of each year. New students should download the UPMC health plan booklet and go to www.upmchealthplan.com for further information and to choose a PCP.

A schedule of monthly rates can be found at:

<http://www.hr.pitt.edu/student-in/graduate-s/medical>

Details on the Davis Vision Plan can be found at:

<http://www.hr.pitt.edu/benefits/student-in/graduate-s/vision>

Details on the Concordia Dental Plans can be found at:

<http://www.hr.pitt.edu/benefits/student-in/graduate-s/dental>

http://www.hr.pitt.edu/sites/default/files/uploads/student_benefits/Graduate%20Student%20DHMO%20Certificate%209-1-2011.pdf

Travel Grants

Students attending scientific conferences are encouraged to apply for travel grants available from different sources at the University of Pittsburgh, including the Dietrich School of Arts and Sciences, and the GSO. For more information go to:

<http://www.asgso.pitt.edu/doku.php/grants>

<http://www.asgraduate.pitt.edu/node/337>

Conflict Resolution, Leaves of Absence & Readmission

Conflict Resolution

Significant conflicts between student and Faculty Advisor are not common, but should they arise, the following steps should be taken.

- The student should write to the Dissertation Committee and the DGS, outlining the issue at hand and request a meeting with the committee. The Dissertation Committee will then meet with the student and Advisor separately to discuss the problem and identify possible solutions and, if appropriate, recommend a meeting with both.
- If this is not successful, the student will request a meeting with the DGS. The DGS will meet separately with the student, the Dissertation Committee and the Advisor. The DGS will then make specific recommendations to the student and/or the Advisor.
- In the unusual situation where it is agreed that the relationship between a Dissertation Advisor and a student has broken down irretrievably, and the student is still in good standing in the department, the DGS will recommend that the student identify a new Advisor from faculty in the department.

Disagreements that cannot be resolved within the Department should be taken to Dean Kathleen Blee, Associate Dean of Graduate Studies and Research in the office of the Dietrich School of Arts and Sciences Graduate Studies (412 624-6094; bleegrad@pitt.edu).

Leaves of Absence

In special circumstances a leave of absence from the graduate program may be granted. If a student and Advisor agree that this would be an appropriate step to make they should discuss this with the DGS and a formal request should then be made to GPOC. If GPOC agrees to support the leave of absence, the DGS will then make a formal request to the Assistant Dean of Graduate Studies, stating the reason for the request and the length of time being requested. The application can be made for a maximum of one year for master's students or two years for doctoral students; a leave of absence can be taken only once during a graduate career.

After returning, the statute of limitation following matriculation is extended for the period of the leave. That is, a student entering with a BS would need to defend within 11 years of matriculation if a 1-year leave of absence were taken. The statute of limitations on comprehensive exams cannot be extended. If the leave result in failure to register for 3 semesters, the student needs to apply for readmission, though no fee is required in this case readmission is automatic.

Readmission

If a student fails to register for 3 consecutive semesters, that student becomes inactive. The inactive status does not act as a leave of absence so that statutes of limitations are not adjusted. For students to continue their graduate work, they must apply for readmission and register once again. **To graduate, students must be registered during the semester they defend their thesis.**

Readmission will only be considered if the student presents a plan for readmission to GPOC before becoming inactive. This plan should include the reason for failing to register, the time frame for readmission, and a plan of study for completing the degree once readmitted. The student should include an assessment by the student's committee that this plan is reasonable and achievable.

Requirements for Readmission

The requirements for readmission, as determined by the Dietrich School, are outlined below:

- Readmission application (available from the GPA)
- Admissions credential evaluation (available from the GPA)
- Application fee (consult the GPA for its current amount)
- Statute extension form, if necessary (available from the GPA)
- A detailed plan of study, including realistic dates; if any milestones are not met, students are terminated from the program. This agreement must be signed by the student and the Department Chair.
- A memo certifying that courses completed more than 10 years ago are relevant to current degree. This must be provided by the Chair of the Dissertation committee.
- If comprehensive exam was taken more than 7 years prior to graduation, it must be retaken.

When a student requests readmission, these materials must be submitted to GPOC. If GPOC and the Chair approve the application, the Department will forward the materials to the Dietrich School.

Appendix A: Overview of Requirements for EE Program

Year 1	Coursework	<ul style="list-style-type: none"> • Completion of at least 4 of 8 required credits of formal graduate coursework • Complete <i>Communication in Biological Sciences</i> Workshops 1 & 2: <i>Grants & Posters and Presentations</i> • Seminars in Ecology and Evolution (2520, 2530, 2540 and/or 2560): at least 2 courses before the end of the second year • Departmental Seminar (2960; F,S): attendance weekly plus journal club • EE Student Research Seminar (2050; F,S): attendance each week • Ethics: on-line course and Biosc 2058 workshop on scientific ethics • Prevention of Sexual Harassment: on-line course
	Research	<ul style="list-style-type: none"> • Three 10-week rotations (15-minute presentation after each); two rotations may be performed in the same laboratory • Mentor may have been chosen on entry; if not, choose by end of Spring semester • Departmental Retreat: attendance
Year 2	Coursework	<ul style="list-style-type: none"> • Complete total of 8 credits of formal graduate coursework • Departmental Seminar (2960; F,S): attendance only • EE Student Research Seminar (2050; F,S): attendance weekly
	Research	<ul style="list-style-type: none"> • Dissertation research • Annual committee meeting • EE Student Research Seminar (2050; F,S): presentation • Departmental Retreat: attendance and participation
	Teaching	<ul style="list-style-type: none"> • Teaching Assistant, one term, typically in the second or third year
	Comprehensive exam	<ul style="list-style-type: none"> • Completion deadline: mid-April (written); early May (oral). See Grad guide for more detailed guidelines.
Year 3 and beyond	Coursework	<ul style="list-style-type: none"> • Complete <i>Communication in Biological Sciences</i> Workshop 3 : <i>Papers</i> • Departmental Seminar (2960; F,S): attendance only • EE Student Research Seminar (2050; F,S): attendance each week
	Research	<ul style="list-style-type: none"> • Dissertation research • EE Student Research Seminar (2050; F,S): presentation • Annual committee meeting. Note: One must be Overview Meeting. See Grad Guide for details • Departmental Retreat: attendance and participation
	Teaching	<ul style="list-style-type: none"> • Teaching Assistant, one term, typically in the second or third year • Teaching Assistant, second term, for students enrolled in the Teaching Minor
	Dissertation	<ul style="list-style-type: none"> • PhD awarded upon submission, defense, and approval of dissertation

Appendix B: Overview of Requirements for MCDB Program

Year 1	Coursework	<ul style="list-style-type: none"> • Completion of at least 4 of 8 required credits of formal graduate coursework • Complete <i>Communication in Biological Sciences</i> Workshops 1 & 2: <i>Grants & Posters and Presentations</i> • <i>Seminar in Molecular Cell and Development Biology</i> (2450; F, S): at least 2 courses by the end of the second year • Departmental Seminar (2960; F,S): attendance weekly plus journal club • MCDB Student Research Seminar (2050; F,S): attendance weekly • Ethics: on-line course and Biosc 2058 workshop on scientific ethics • Prevention of Sexual Harassment: on-line course
	Research	<ul style="list-style-type: none"> • Three 10-week rotations (15-minute presentation after each) • Choose mentor by end of Spring semester; Dissertation research begins in summer • Departmental Retreat: attendance
Year 2	Coursework	<ul style="list-style-type: none"> • Complete 8 credits of formal graduate coursework • Departmental Seminar (2960; F,S): attendance only • MCDB Student Research Seminar (2050; F,S): attendance weekly
	Research	<ul style="list-style-type: none"> • Dissertation research • Annual committee meeting • MCDB Student Research Seminar (2050; F,S): presentation • Departmental Retreat: attendance and participation
	Teaching	<ul style="list-style-type: none"> • Teaching Assistant, one term, typically in the second or third year
	Comprehensive exam	<ul style="list-style-type: none"> • Completion deadline: mid-April (written); early May (oral). See Grad guide for more detailed guidelines.
Year 3 and beyond	Coursework	<ul style="list-style-type: none"> • Complete <i>Communication in Biological Sciences</i> Workshop 3 : <i>Papers</i> • Departmental Seminar (2960; F,S): attendance • MCDB Student Research Seminar (2050; F,S): attendance
	Research	<ul style="list-style-type: none"> • Dissertation research • MCDB Student Research Seminar (2050; F,S): presentation • Annual committee meeting. Note: One must be Overview Meeting. See Grad Guide for details • Departmental Retreat: attendance and participation
	Teaching	<ul style="list-style-type: none"> • Teaching Assistant, one term, typically in the second or third year • Teaching Assistant, second term, for students enrolled in the Teaching Minor
	Dissertation	<ul style="list-style-type: none"> • PhD awarded upon submission, defense, and approval of dissertation

Appendix C: Graduate Courses and Workshops Offered by the Department of Biological Sciences

Course	Description	Term(s)	Credits
2000	Research and Thesis for the Master's Degree	F,S,Sm	Var
2050	Student Research Seminar	F,S	1
2055	Science Communication : Fellowships and Grants	F	1
2056	Science Communication : Seminar and Poster Presentations	S	1
2057	Science Communication : Preparation of Scientific Papers	Variable	1
2058	Ethical Practices in Scientific Research	F	1
2040	Protein Structure and Function	Variable	2
2090	Advanced Developmental Biology	Variable	2
2100	Cellular Structure and Morphology	Variable	2
2110	Microbial Diversity	Variable	2
2130	Genetics of Model Organisms	Variable	2
2140	Genomics	Variable	2
2145	Protein Life History	Variable	2
2150	Nucleic Acids	Variable	2
2351	Advanced Evolution	Variable	2
2361	Advanced Ecology	Variable	2
2155	Gene Expression	Variable	2
2370	Evolutionary Genetics	Variable	2
2105	Cell Signaling	Variable	2
2355	Species Interactions	Variable	2
TBA	Model Organisms in Context	Variable	2
2320	Population Biology	F	3*
2350	Evolution	Sp	3*
2450	Biological Sciences Seminar	F,Sp	2
2540	Seminar in Ecology	F,S	2
2550	Experimental Designs in Ecology	Sm-pym	3
2570	Environmental Science Teacher's Workshop	Sm-pym	3
2810	Macromolecular structure and function	F	4*
2840	Regulation of Membrane Trafficking	Sm	2
2960	Departmental Seminar	F,S	1
2970	Teaching of Biological Sciences	F,S,Sm	Variable
2972	Teaching Minor in the Biological Sciences	F,S	Variable
2990	Independent Study	F,S,Sm	1
3000	Research and Dissertation for the Ph.D. Degree	F,S,Sm	Variable
3902	Directed Study	F,S,Sm	Variable

Blue Formal Graduate Courses; credits in these courses count towards the 8 credits of formal coursework required for completion of the PhD degree.

Red Communication and Ethics Workshops, offered on a rotating basis. All four workshops must be completed.

Green Graduate Seminar courses; two terms are required within the first two years.

Magenta Graduate sections of shared undergraduate courses; only 2 credits count toward the requirement of 8 credits of formal graduate coursework.

Black Other graduate courses.

Abbreviations : Sm-pym, offered at the Pymatuning Laboratory of Ecology; Var, Variable; these courses are typically offered once every other year. Consult actual course listings on the Pitt website to confirm that a course is being offered in any semester: http://www.registrar.pitt.edu/schedule_of_classes.html

Appendix D: Courses Offered Outside the Department That May Count Towards Degree Requirements

Approved by GPOC; Fall 2015

Students enrolled in the MCDB and EE programs must complete 8 credits of formal coursework. The courses listed below are offered outside the Department and will count toward fulfilling this requirement. Because the workload of courses offered in different departments varies, the number of credits counting toward fulfilling this requirement may differ from the number of credits listed on the graduate transcript.

University of Pittsburgh

Course	Description	Credits	
		Listed	Toward Requirement
BIOST 2014	Intro to Biostatistics for Biomedical Scientists	3	2
BIOINF 2051	Intro to Bioinformatics	3	2
BIOST 2041	Intro to Statistical Methods 1	3	2
BIOST 2042	Intro to Statistical Methods 2	2	2
BIOST 2055	Intro to High Throughput Genomic Analysis I	2	2
EPIDEM 2725	Reproductive Development	2	2
IDM 2001	Molecular Biology of Microbial Pathogens	3	2
IDM 2014	Functional Genomics of Microbial Pathogens	3	2
INTBP 2040	Using Perl for Bioinformatics	3	2
MOLBPH 2001	Molecular Biophysics 1: Structure	3	2
MSBMG 2510	Biochemistry of Macromolecules	2	2
MSBMG 3510	Advanced Topics in Gene Expression	3	2
MSCBIO 2075	Molecular Evolution	3	2
MSMVM 3410	Microbial Pathogenesis	2	2
MSMVM 3420	Viral Pathogenesis	2	2
MSCBMP 2840	Regulation of Membrane Traffic	2	2
MSCMP 2730	Molecular Methods of Tissue Growth & Differentiation	3	2
MSMPHL 2310	Principles of Pharmacology	3	2
MSMPHL 3330	DNA Repair: Biochemistry to Human Disease	2	2
PHYS 3101	Special Topics	1	1

Carnegie-Mellon University

Course	Description	Credits	
		Listed	Toward Requirement
BIOSC 0438	Physical Biochemistry	3	2
BIOSC 0738	Physical Biochemistry	3	2
BIOSC 03-871	Structural Biophysics	3	2
CMBIOSC 0711	Computational Molecular Biology & Genomics	4	3
BIOSC 03-512	Computational Methods for Biological Modeling and Simulation	3	2

Appendix E: Information and Instructions for Application for Advanced Level Entry into the MCDB or EE programs

Key differences between Standard Level Entry (SLE) and Advanced Level Entry (ALE)

- ALE 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.
- ALE students will be exempt from most first year requirements including research rotations, Graduate Seminar Course and 4 credits of formal coursework, unless it has been decided that they should complete any course work to fill deficiencies in their previous training (all rules governing grade requirements for SLE students taking these courses will also apply). However, students must take the on-line ethics course and attend the ethics workshop (Biosc 2058). Which courses or workshops will be waived and which must be taken will be decided on an individual basis by GPOC in consultation with the Dissertation Advisor.
- ALE students could receive up to twenty four transfer credits for their Master's degree or previous study.
- ALE 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, and dissertation proposal.
- A satisfactory Annual Committee meeting within the first year will substitute for the Preliminary Evaluation.
- Financial support for ALE students should normally come either from GSR monies from the Dissertation Advisor or from a fellowship awarded to the student.
- ALE 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, ALE 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
- It is understood that faculty may lose grant funding and be unable to provide GSR monies; under these circumstances an ALE student would be treated in the same way as a standard student in our programs and would be supported by a TAship if sufficient numbers were available.
- The total number of ALE students should not exceed 20% of the total graduate student body and there should not be more than 2 ALE students per lab.

Application process

Recruitment

1. Faculty will inform GPOC that they are interested in recruiting an ALE student and must confirm that they can provide a minimum of two-years of support with GSR monies (note this is not required if the student has their own fellowship, see below).
2. Faculty names will be listed on the website.
3. Faculty can also advertise in appropriate media; any advertisement must be approved by GPOC. The advertisement must clearly state that the student will join the MCDB or EE program in the Department of Biological Sciences as an Advanced Level Entry student.

Admissions

1. Before applying, prospective ALE students must correspond with the faculty member they are interested in to confirm that an application through this mechanism is appropriate.
2. If the faculty member supports an application, the student will apply through the regular ApplyYourself mechanism, providing three letters of reference, a recent transcript, TOEFL scores (or equivalent) if required and a personal statement, in addition to a completed standard application form. The student will inform the faculty member that they have applied and then the faculty member will inform the Graduate Recruiting and Admissions Committee (GRAC).
3. Applications can be made at any time of the year.
4. GRAC will download ALE applications and pass them onto the faculty member identified. The faculty member, who should already be familiar with the applicant, will then review the application.
5. If the faculty member supports the student joining the program, they will then submit a letter of support to GRAC in which they will confirm that they:
 - a. Are willing to act as the Dissertation Advisor of the student
 - b. Confirm they have no more than one DE student currently in their lab.
 - c. Have grant monies available to cover 2 years of stipend support or that the student has been awarded a fellowship to cover living expenses (see below).
 - d. Have reviewed the application materials and to the best of their knowledge agree that the studies already completed by the student are approximately equivalent or exceed that expected of first year students in our own program.
 - e. Specify any deficiencies in the studies previously completed by the student.
 - f. State which required courses should be waived and which should not.
6. If the student has been awarded a fellowship to cover living expenses they must provide evidence for this. The fellowship must be for at least three years and provide funds of at least \$14,000 per year.
7. GRAC will then review the application and if they agree to support the application it will be passed onto GPOC to be approved. If approved by GRAC and GPOC, the application will be sent to the Dean by the GPA, as with all other requests for admission.

Appendix F: Undergraduate Courses Taught By the Department of Biological Sciences That Typically Utilize Teaching Assistants

Fall Semester

0050	Foundations of Biology Lab (only an option if other TA positions filled)
0100	Preparation for Biology
0190	Introduction to the Biological World (HHMI)
0350	Genetics
0390	Ecology Lab
1000	Biochemistry
1005	Introduction to Biochemistry Lab
1210	Vertebrate Morphology Lab
1440	Animal Behavior
1510	Cell Biology Lab
1810	Macromolecular Structure and Function
1855	Microbiology Lab
1860	Microbiology Lab (for Microbiology majors)
1950	Molecular Genetics Lab

Spring Semester

0060	Foundations of Biology Lab (only an option if other TA positions filled)
0191	Introduction to the Biological World (HHMI)
0350	Genetics
1000	Biochemistry
1130	Evolution
1530	Developmental Biology Lab
1820	Metabolic Pathways
1830	Biochemistry Lab
1855	Microbiology Lab
1880	Animal Physiology Lab

Summer Semester

0050	Foundations of Biology Lab (three 0.5 TA positions)
0060	Foundations of Biology Lab (three 0.5 TA positions)
0350	Genetics (1 TA position)
1000	Biochemistry (one 0.5 TA position)
1850	Microbiology (one 0.5 TA position)
PLE lab courses (approximately seven 0.5 TA positions)	

Note, not all courses may have a TA every year.

Appendix G: Current Stipend Rates

Graduate student status	Monthly stipend	Healthcare contribution	Net stipend
A&S Fellowship	\$2657.75	\$344.32 ¹	\$2313.43
Graduate student researcher (GSR)	\$2259.75	0 ²	\$2259.75
Teaching Assistant (TA)	\$2141.25	0 ²	\$2141.25
Teaching Fellow (TF)	\$2225.00	0 ²	\$2225.00

All rates are current as of August 2014.

A&S Fellowship. These fellowships are typically awarded to first year students to cover Fall and Spring semesters during research rotations.

Graduate Student Researcher. This stipend is financed by Thesis Advisor's grant.

Teaching Fellows. Students may be assigned as a TF rather than a TA if they have taught at least one semester in our department

1. This health care contribution is the standard amount for a single student for the Panther Blue Health Plan; students must pay this themselves out of their stipend.
2. The health care contribution is provided by the University or from overheads taken from the Advisor's grant.