DEPARTMENT OF BIOLOGY
GRADUATE STUDENT HANDBOOK
2015-2016

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OVERVIEW OF THE DEPARTMENT OF BIOLOGY Ph.D. PROGRAM

The following abbreviations are used in this handbook:

DAC: Dissertation Advisory Committee
GAC: Graduate Affairs Committee
IE^2: Institute of Ecology and Evolution
IMB: Institute of Molecular Biology
ION: Institute of Neuroscience
OIMB: Oregon Institute of Marine Biology
QE: Quarterly Exams
QARC: Quarterly Advisory and Review Committee

The majority of this handbook is applicable only to students entering the Ph.D. program. Students entering the MS program should refer to the Guidelines for a Thesis Master's Degree section of this handbook.

ORIENTATION

A series of orientation activities for incoming graduate students will be scheduled for the two weeks prior to the start of classes. All incoming students are expected to attend, although exceptions may be made for students at OIMB. The activities include training in lab safety, CPR, first aid, teaching effectiveness, and workshops on topics relevant to life as a graduate student. In addition, social events, institute retreats, and meetings with Interim Advisory Committees are scheduled for this period. Incoming students will be notified of the orientation schedule during the summer prior to their arrival on campus.

ACCESSIBLE EDUCATION

The University of Oregon is working to create an inclusive learning environment. If you have a disability that could impede your learning and research experience, please contact the Accessible Education Center for further information (164 Oregon Hall; 6-1155 or uoaec@uoregon.edu). They will work with you to help facilitate your learning experience.

INTERIM ADVISORY COMMITTEE

The Graduate Affairs Committee (GAC) will appoint an Interim Advisory Committee for each new Ph.D. student before the beginning of the first term in residence. The committee shall consist of two or three Biology Department faculty, including at least one faculty member who is familiar with the requirements of the student's intended area of study. Each student is affiliated with one of four research institutes (IE^2, IMB, ION, OIMB), and the committee includes a representative of the Graduate Admissions Committee or the Graduate

Affairs Committee from the student's home research institute. At the discretion of the Graduate Affairs Committee, special committees can be assembled for students whose interests span institute boundaries (e.g., Evo-Devo). A meeting between the student and the Interim Advisory Committee will occur before registration for the first term in residence. The student will be notified of the makeup of the committee and of the meeting arrangements as soon as possible after arrival on campus.

During this meeting:

1) The student's background, goals, and plans for a graduate program will be discussed. Specific advice will be offered about course work for the first year in the program. Students must register for a minimum of 9 credits and a maximum of 16 credit hours each term of the academic year during the first year (fall, winter, spring). For guidance about summer registration, students should consult with their advisor and Gabrielle Andrew.

2) Advice will be offered to help the student choose laboratories for lab rotations. It is understood that students will make decisions about winter and spring rotations later in the year. The student is responsible for making arrangements for laboratory rotations as described in the Laboratory Rotation Program section of this handbook.

3) The nature of graduate teaching assignments will be discussed and the student will be advised about the process of allocating teaching assignments. Three terms of teaching are required prior to advancing to candidacy. The teaching experience is intended to help the student develop teaching skills. For more information about teaching assignments and expectations, see the Teaching Requirement section of the handbook.

Unless the student or Interim Advisory Committee requests an additional meeting, this committee meets only once with the student before being replaced by the Quarterly Advisory and Review Committee (QARC) at the end of the Fall quarter.

COURSE REQUIREMENTS

BI610: Ethics in Life Sciences Research

All Biology Ph.D. candidates on the main campus are required to take *Ethics in Life Sciences Research* during their SECOND year. This course is generally offered only one term each year.

Journal Clubs

All IMB, OIMB, IE^2 and ION students are required to register for, and participate in, one Journal Club each term of each academic year. Students are required to make at least one journal club presentation each year, starting in Year 2. See the

UO course catalog for current journal club offerings. Students who are off campus for research purposes or have conflicts with teaching assignments are exempt from this requirement. The exemption is given on a case-by-case basis. The student must email Gabrielle Andrew to request an exemption.

Seminars

Each research institute sponsors a series of research seminars during the academic year. The seminars are typically given by prominent scientists from other institutions. Students are required to register for and attend seminars in their research area each term that relevant seminars are offered. Students who are off campus for research purposes or have conflicts with teaching assignments are exempt from this requirement. The exemption is given on a case-by-case basis. The student must email Gabrielle Andrew to request an exemption.

Other course requirements are set by the research institutes and the IAC, QARC and DAC according to each student's interests and goals.

Policy on Registering for Supervised College Teaching

Graduate students should NOT register for Supervised College Teaching except in the very unusual circumstance that they are not being paid for teaching.

LABORATORY ROTATION PROGRAM

Choosing an area of research for the Ph.D. dissertation and finding a faculty member to serve as dissertation advisor are crucial tasks that a beginning graduate student must complete during the first year. To aid students in this process, the Biology Department has a lab rotation program. This program exposes students to a variety of biological subdisciplines and research philosophies, and it helps students become integrated into our scientific community by introducing them to the personnel in different laboratories and, in some cases, different institutes. Through immersing themselves in various lab groups during the first year, students gain a sound basis for choosing the lab best suited to their interests, personalities and abilities.

Doctoral students are required to rotate in three separate labs during their first year in residence. Exceptions are rare, and must be recommended by the student's Interim Advisory Committee or QARC and approved by the chair of the GAC. **As soon as it is practical (at least several weeks before the end of the term prior to the planned rotation), students should contact faculty whose labs they are considering for their next rotation to discuss possible rotation projects and to determine whether a rotation that term will be feasible. Students are encouraged to use the rotation program to explore as wide a range of biological subdisciplines as their interests dictate.** They are permitted to rotate into labs of any institute or department. Except in extraordinary circumstances, a student will go to a different lab each term.

Students typically choose a dissertation laboratory near the end of spring term and begin their dissertation research in the summer following their first year. If a student has not selected a dissertation lab by the end of spring term, it is possible for the student to arrange a fourth rotation in summer term, if approved by the head of the Institute (ION, IMB, IE^2, OIMB) most closely aligned with the student's research interests. In some cases, arrangements can also be made for a newly admitted student to do research during the summer before beginning their Ph.D. program. If a student chooses to do this, their dissertation laboratory will still be chosen at the end of spring term of the first year. For more information on choosing a dissertation advisor, see Selecting a Thesis Advisor and Dissertation Advisory Committee. **Failure to identify a dissertation advisor (and have them agree to serve in this role) within the first year is regarded as insufficient progress and is grounds for termination from the program** (see Evaluation of Progress).

The following guidelines for students and faculty are meant to prevent any misunderstandings about rotation expectations and evaluation:

1) At the beginning of each rotation, the student should meet with the faculty mentor to discuss expectations for the rotation. Expectations should be made as explicit as possible, including a description of what would be deemed passing work. Faculty members are reminded that students may be teaching, taking courses, and taking quarterly exams at the same time they are rotating; thus, they cannot devote their entire effort to lab work. However, students should plan to immerse themselves in their rotation projects. While it is possible that a publication may result from a rotation, this should not be an expectation, nor should a positive scientific result from a project be required for a passing grade in a rotation. While students are expected to devote considerable time and attention to the rotation, a solid effort, not positive results, is the principal criterion for passing a rotation. Students should also get a clear understanding of the hours of effort expected from the faculty mentor before starting the rotation. This can vary substantially from lab to lab.

2) During the rotation, the faculty mentor and student should meet on a regular basis. During these meetings, the faculty should provide feedback about the student's performance and whether the rotation is meeting the agreed-upon expectations.

3) A rotation lasts only a single term. Thus, at the end of the term, a rotation is over even if the project has not been completed. The student is under no obligation to complete the project at a later time. Similarly, unless the student has made specific arrangements with the faculty mentor, the student should not expect the project to be "saved" in case he or she decides later to join that lab.

4) If a student is potentially interested in joining a rotation lab, s/he should have an explicit conversation with the faculty mentor at the end of the rotation to find out whether they would be welcome to do so.

5) At the end of the term, the faculty mentor must provide a written evaluation of the student's performance to the GAC member for the research unit that admitted the student (ION, IE^2, IMB, OIMB). If a student has not met the expectations for satisfactory progress, this should be reflected in the report. However, because they should have received previous feedback that their performance was inadequate, an unsatisfactory evaluation should not come as a surprise to the student. A summary of the rotation report will be included in the Quarterly Progress Report prepared by the student's QARC (see below).

Rotation Presentations

During Finals Week of each term, students present their rotation projects in a symposium of short "rotation talks" scheduled by the Department of Biology. It is expected that faculty mentors will assist students in preparing their rotation talks (e.g., by critiquing a practice talk). Each student will organize a ten- to twelve-minute talk that includes:

1) A brief introduction to the project, relevant background information, and how the project is related to the laboratory's goals.

2) Results obtained (if no results - explain problems encountered, etc.).

3) Description of the next steps to be taken if the project were to be pursued. There will be up to five minutes of discussion following the presentation. All faculty and first-year students are expected to attend; others are also welcome.

TEACHING REQUIREMENT

All candidates for the Ph.D. degree are required by the department to serve three terms as a Graduate Teaching Fellow (GTF) for courses within our program. First-year students normally serve as a GTF for one course during each of the three quarters in the academic year. In special cases, teaching may be deferred if the student's home institute agrees and can demonstrate a workable plan that is consistent with the requirements of available funding sources. **A student cannot advance to candidacy until the teaching requirement has been fulfilled** (see Advancement to Candidacy). Students with a strong interest in teaching may serve as a GTF for additional terms beyond the required three terms during their graduate career, but only with the consent of their dissertation advisor.

A written evaluation of the student's work as a teaching assistant will be completed at the end of the quarter by the faculty member(s) with whom they have

served as a GTF. This information will become part of the student's graduate file and a copy will be given to the student.

To ensure equitable distribution of teaching assistantships among students, and to provide competent teaching for the courses being offered each term, the following guidelines will be used in assigning graduate teaching fellows to courses:

1) Assignment of teaching fellows to specific courses: The courses offered within the department will be matched to individual teaching fellows according to the specialized needs of the course and to the specific teaching skills of the students. Whenever possible, the needs and wishes of both the professors and the graduate students will be accommodated during this matching process, but we cannot guarantee that the student will receive their first choice. All of the graduate students with firm commitments of support as teaching fellows for a term will receive assignments before other graduate students are considered for teaching fellowships.

2) Allocation of teaching fellowships to otherwise unsupported graduate students: All graduate students without current support who are interested in teaching assignments should apply to the curriculum director at least one term prior to the beginning of the term for which support is needed. If there remains a need for more teaching assistants and if funds are available, these applicants will be considered for teaching needs on a term-by-term basis. When the number of available teaching slots is fewer than the number of applicants, GTF assignments will be prioritized based on current departmental policy, as described in the GDRS document available via the Biology Department Website.

GTF PROCEDURES AND INFORMATION

GTF Workspace: If a room is needed for office hours, review sessions, or a special meeting, please contact the department secretary. Plan to give a little lead-time, as she will need to negotiate with the Scheduling Office.

Access to Private Meeting Space: Please see above.

Telephones: GTFs are welcome to use a phone in the Biology Office (77 Klamath) for work-related calls. Likewise, if someone needs to reach a GTF, they may call the Biology Department and a staff member will take a message and forward it to the GTF.

Computers: A work/study station equipped with a computer is available in the Biology Office for use by GTFs, if needed.

Office Supplies: The Biology Office has supplies and equipment for the department's GTFs to use for instructional purposes.

Photocopies and Printouts: GTFs are welcome to use the copier in the Biology Office. The department secretary can assist in making arrangements for Campus Copy Center jobs, if that service is needed.

GTF Office Manual: An office manual, with more detailed information about resources and policies, is updated each year. The GTF Manual can be found online at biology.uoregon.edu under Graduate Studies.

QUARTERLY ADVISORY AND REVIEW COMMITTEE (QARC)

The QARC advises and reviews the progress of each first-year Ph.D. student. It is composed of a member of the GAC and the head of the research unit (IE^2, IMB, ION, OIMB) most closely aligned with the student's research interests. The QARC meets with the student shortly after the rotation presentations (Fall, Winter and Spring quarters of the first year) to discuss the student's progress and plans. The GAC member of the QARC then prepares a Quarterly Progress Report that summarizes the student's progress, including a summary of the rotation report, quarterly exam grade, teaching evaluation, plans for future rotations, coursework completed and pending, and any other relevant information. The Quarterly Progress Report will be sent to the student and included in the student's permanent file. Feedback given at these meetings should be taken very seriously. **Failure to remedy deficiencies noted in the Quarterly Progress Report can be grounds for termination from the program due to unsatisfactory progress.**

QUARTERLY EXAMS

Students are required to take three quarterly exams (QEs), one each in the fall, winter and spring terms of their first year. Quarterly exams are designed to foster intellectual growth in four main respects: (i) breadth of biological knowledge, (ii) critical reading of the primary biological literature, (iii) identification of significant research questions, and (iv) experimental logic and design. Some QEs are knowledge-based, whereas others are in the format of a research proposal.

Knowledge-based quarterly exams are written by faculty in each of the research units each term. Students are free to choose which knowledge-based exam they will take (including QEs offered by the Chemistry Department), except for students in OIMB and ION's Neurons, Circuits & Behavior Program who must take knowledge-based QEs in their respective research units. QEs in the spring term are proposal-based, and must be taken in the student's research unit. Students in IMB are strongly encouraged to take the IMB exam each term, as these are designed to provide stepwise training exercises in scientific logic and proposal writing.

Quarterly Exam Dates, Fall 2015 – Spring 2016.

Institute	Fall	Winter	Spring
IMB	Oct. 15*	Jan. 14*	Take home exam, due April 7
ION	Oct. 15*	Jan 14*	*Topic statement:* Mar. 18* *Specific Aims page:* Apr. 7* *Revised Specific Aims and Research Strategy:* May 9*
IE^2	Oct. 15*	Jan. 14*	*Abstract:* Apr. 7* *Revised Proposal:* May 9*
OIMB	Week 10	Week 10	Week 10

*** dates are tentative and may be updated**

Quarterly exams will be given letter grades. Consistent with Graduate School policy, a grade of **B or above is considered satisfactory**, a **B- is considered marginal ,** and a **C+ or lower is considered unsatisfactory**. A student who earns a C+ or lower on one exam will need to make it up by taking the fall term quarterly exam during their second year (see exception for IE^2 spring quarterly below). A total of three quarterly exams with a grade of B- or better are required. A student who earns a B- or lower on two exams must meet with their QARC to discuss whether they should continue in the graduate program and, if so, under what conditions.

IMB

Preparatory information for the Fall and Winter QE's will be available online one week before each exam. These exams may be in "take home" format, or may be administered during a two-hour evening session, according to the preferences of the faculty member preparing the exam. The exams will be graded and returned to the students within two weeks. The examiner should then meet with the students, as a group or individually, to discuss the exam. Any student who receives a B- or below should meet individually with the examiner to review the results.

The spring term exam will be a take-home exam, with materials provided at least 2 weeks prior to the due date. Students will be provided with a set of papers on a current topic. The examiner will suggest a hypothesis or alternative models that arise from these papers. Students will then develop an outline of a research proposal to distinguish between the models or test the hypothesis. Detailed guidelines will be provided near the end of Winter term.

IE^2

QE's in the fall and winter will be administered during a two-hour evening session. The exams will be graded by the faculty member who wrote the exam and returned to the students within two weeks. The examiner should then meet with the students, as a group or individually, to discuss the exam. Any student who receives a B- or below should meet individually with the examiner to review the results.. Students planning to carry out dissertation research in a lab in IE^2 must take the IE^2 spring quarterly exam. As with the other QE's, an individual faculty member in IE^2 will administer and grade this exam. To pass, a student must write a research proposal on a topic of interest that is unrelated to their anticipated dissertation topic. The purpose of this exercise is to allow students to demonstrate that they can identify an important research topic, frame a testable hypothesis and design and interpret experiments to test the hypothesis. Most importantly, this activity provides students with the opportunity to practice formulating and communicating a feasible, logical, and hypothesis-driven set of research questions. In doing so, students should examine the relevant backgound literature on their topic and discuss the types of experiments and data that conceivably could be collected to test these hypotheses. While it is not necessary to present an explicit experimental plan that details an exact methodology, information on the types of experiments that would be conducted - and their implications - is essential. In this light, the proposal is similar in format to the NSF preliminary proposals that are now required for the Division of Environmental Biology (DEB) and the Division of Integrative Organismal Systems (IOS). These are four page proposals (maximum) but should not include a Broader Impacts section. A commonly followed practice is to break the proposal into the following sections: Overview, Specific Aims/Objectives, Background/Preliminary Data, Experimental Plan.

To ensure that the topic is appropriate, the student must first submit an abstract to the administering faculty member by April 7 (the date of other QE's in spring term). This abstract should identify the topic and general approach. Once the topic is approved by the administering faculty (in writing or by email), the student must complete their proposal and submit it for grading within 30 days. No faculty input is allowed, but students are encouraged to consult with their peers during preparation of their proposals. The faculty member administering the exam is responsible for providing these instructions to the students by the end of the first week of spring term. Students who do not pass this exam will have the opportunity to retake it during the summer or fall term.

ION

QE's in the Fall and Winter, which are knowledge-based, will follow the same schedule and procedures as the IMB Fall and Winter exams. For students in ION's Developmental Biology track, topics for these exams are:

Fall: Developmental neuroscience (TBA), or the IMB fall quarterly
Winter: Developmental neuroscience (TBA), or the IMB winter quarterly

For students in ION's Neurons, Circuits & Cognition track the topics are:

Fall: Cellular neuroscience
Winter: Systems neuroscience

The spring term quarterly exam in ION will involve writing a research proposal. Although this exam, like any other, is partly evaluative in nature, its main objective is to provide training in identification of important research topics, framing of testable hypotheses, and design and interpretation of specific experiments to test the hypotheses. A second purpose of the exam is to familiarize the student with the content, structure, and format of an NIH NRSA application, for possible submission of a real NRSA proposal at the end of year 3.

The subject of this proposal should fall within the general focus of the student's research unit, but it must be unrelated to the anticipated topic of the student's dissertation. Students unsure of the suitability of their topic should consult with the faculty member administering the exam. Students must develop the ideas and write these proposals independently. However, they are encouraged to discuss their work with other students and postdoctoral fellows. Discussions with faculty members are limited to advice on techniques; there shall be no discussion of experimental logic and design.

There are three phases to the exam (due dates appear in the table above):

(1) Submission of the Topic Statement (1 page maximum). This document must identify the topic of the proposal, including its significance and the general experimental approach. The document must also explain how the specific research question to be addressed differs from the likely subject area of the student's dissertation research. The Topic Statement will be evaluated in terms of the goals of the exam; resubmissions based on faculty feedback may be required.

(2) Submission of the Specific Aims page, written in the format of this component of an NRSA proposal.*

(3) Submission of the revised Specific Aims page and the Research Strategy, written in the format of an NRSA proposal.*

* Follows the content, page limitations, and formatting guidelines of the National Research Service Awards for Individual Predoctoral Fellows (F31), as spelled out in the *Detailed Instructions for ION Proposal Examinations* at the end of this document.

The proposal will be scored according to NIH's Criteria and Considerations for Research Project Grant http://grants.nih.gov/grants/peer/critiques/rpg.htm#rpg_01. The catagories to be scored are Significance, Approach, and Overall Impact.

OIMB

Ph.D. students in marine biology must take the OIMB quarterly exams during the three terms of their first year. Two of these exams will be comprehensive in nature and will test general knowledge of biology with the expectation that students demonstrate understanding at the level of a BS degree in biology. In the third quarter, Ph.D. students will write a mock proposal (described below) similar to that done in the IE^2 group.

During the first Interim Advisory Committee meeting, the student will choose two quarters in which to take their knowledge-based quarterly examinations. During the quarter in which the student is not taking a knowledge-based quarterly examination, they will instead write a research proposal on a topic of their choice.

Grading of OIMB QE's and potential retakes will follow the same rules as the rest of the department, as described under IMB's quarterly exam.

Areas for the two OIMB knowledge-based quarterly examinations:

The topics for each quarter are listed below. At the beginning of each term in which a student will take one of these exams, the students will be given a reading list that may include readings in basic concepts, as well as some recent literature. The written exams will be given during the last week of the regular term (not during finals week) and will be evaluated by one or more marine faculty with expertise in the areas that the respective exams cover.

Fall term: Ecology, Physiology, Biochemistry, Molecular Biology

Winter term: Evolution, Genetics, Functional Morphology

Spring term: Biological Oceanography, Development, Microbiology

The third OIMB QE (the "mock proposal"):

To ensure that the topic is appropriate, the student must first submit an abstract to the administering faculty member (to be selected by the student) prior to writing. This abstract should identify the topic and general approach. Once the topic has

been approved by the administering faculty (in writing or by e-mail), the student can complete their proposal and submit it by the last week of the term. Criteria by which the proposals will be judged are the same as those outlined for all other second year Proposal Examinations. This exam allows OIMB students to demonstrate ability to identify an important research topic, frame a testable hypothesis and design and interpret experiments to test the hypothesis. Students are encouraged to consult with their peers during preparation of their proposals. These proposals should be written in the format for pre-doctoral fellowship applications submitted to the National Science Foundation (NSF). The faculty member administering the exam is responsible for providing the guidelines (or correct website address) to the students. As with the other exams, the proposal will be given a letter grade.

SELECTING A THESIS ADVISOR AND DISSERTATION ADVISORY COMMITTEE

Before the end of spring term, the student should speak with faculty members of laboratories in which s/he may wish to do their dissertation research. The final decision is made by mutual agreement between student and dissertation advisor. They should discuss possible dissertation projects and determine whether dissertation work in that laboratory will be possible. The advisor, in agreeing to mentor a student, assumes responsibility to provide space, materials, and equipment, insofar as these are available, for the student's dissertation research. Students may also choose to do a fourth rotation over the summer following the first year, if they can identify a lab to host them for such a rotation. **If a student is unable to secure a faculty advisor or a fourth rotation by the end of spring term, the student cannot continue in the program.** Likewise, students who do a fourth rotation must find a faculty advisor by the end of the summer if they are to continue in the program. It is sometimes possible, although uncommon, for a student to change advisors, e.g. if research interests change, or if the arrangements turn out to be unsatisfactory to either the student or the advisor.

DACs for ION, IMB and IE^2 students

As soon as a student becomes associated with an advisor (no later than the beginning of the second year of study for the Ph.D.), the student and advisor should discuss the make-up of the Dissertation Advisory Committee (DAC). The student must ask each potential member of the DAC if they are available to serve on the committee. A specific recommendation to the chair of the Graduate Affairs Committee must be made through Gabrielle Andrew by October 1.

DAC Composition Requirements:

1. All five DAC members must be tenure-track faculty (requests for an exception should be directed to the Grad Affairs Committee).

2. At least three members must be full or associate members of the student's institute or members of the Biology Department.
3. At least two members must be in the Biology Department (one of these can be the dissertation advisor).
4. One member must be from outside the Biology Department, but on the UO campus (this is the institutional representative, also known as the "outside member"). The dissertation advisor cannot serve as the institutional rep.
5. At least four members must be on the UO campus.
6. Any non-UO faculty member must be approved by the Graduate School before they can serve on the committee.
7. The student will choose one member to chair the committee; the chair must be in the Biology Department and a full or associate member of the student's institute, but cannot be the dissertation advisor. The chair will prepare reports of the annual DAC meetings.

DAC makeup for OIMB students

The DAC committee will include five members including at least two members of the OIMB faculty, an outside-the-department member, and one member of the Biology Department who is not resident at OIMB. That member will serve as the chair of the proposal examining committee and as the chair of the DAC.

DAC meetings should be scheduled according to the time table below, unless an exception is requested (see below).

DAC Timeline for Students in Each Institute

	DAC (2nd year)	DAC (3rd year)	DAC (4th year)	DAC (5th year and beyond)
To be held by the end of:	IE2: Spring ION: Spring IMB: Fall OIMB: after the qualifying exam and prior to the beginning of spring term.	IE2: Spring Others: Winter	All Institutes: Winter	IE2: Fall Others: Winter

Requests for exceptions are made by emailing Gabrielle Andrew. It is common that students who are scheduled to give a formal talk on their thesis research (e.g. a Friday noon research talk or a talk delivered to the zebrafish group) elect to hold their DAC meeting immediately after that talk. If the talk is later in the year than

the term noted in the table above, the student must request to postpone their DAC meeting until immediately after the talk. These requests must be made to Gabrielle by the end of the term that is the default for the student's institute**.**

It is the student's responsibility to schedule DAC meetings and to notify Gabrielle Andrew of the meeting details (date, time, location), at least several weeks in advance. Failure to meet with the committee and file a progress report (see template below) means that the student is not eligible for continued support from any university source in the following academic year.

Template: Annual Progress Report for Ph.D. students in Biology and Biochemistry

Reports should be provided to members of the Dissertation Advisory Committee (DAC) and to Gabrielle at least 4 days prior to the DAC meeting.

Student Name:
Date and location of DAC meeting:
Home Department and Institute:
Term of entry into graduate program:
Thesis Advisor:
Courses taught at UO:
Courses Taken at UO, and Grades Received:
Advanced to Candidacy? (if so, list term of advancement):
Current Source of Financial Support:
If supported on a Training Grant (TG), list courses taken to satisfy TG requirements:
Outline a plan to complete any remaining TG requirements:
Name of Journal Club and Date of Presentation each year (2nd year and beyond):
Conferences attended (date, name, location of conference; indicate whether you gave a poster or oral presentation):
Publications resulting from research at UO:
Summary of research progress (~3 pages)

Include an introduction to the question being addressed, a statement of the over-arching question and a specific hypothesis (if there is one), a description of the experimental approaches and a summary of results. Be explicit about what has been accomplished since the prior DAC meeting.

Planned research and course work for the coming year (1/2-1 page):
Timetable for completion of the dissertation (4th year and beyond):
Post-graduation plans (4th year and beyond):

The DAC is responsible for seeing that progress is made toward satisfying all departmental, Graduate School, and University requirements for the Ph.D. degree. The DAC is also responsible for ensuring that students supported on training grants fulfill the appropriate course requirements.

The chair of the DAC will provide a written report of the annual DAC meeting to the GAC in which they indicate whether they feel the student is making satisfactory progress toward their Ph.D. degree. Other members of the DAC must approve the report before it is submitted. One of three recommendations can be made:

- Continuation as a graduate student with support. Only in extraordinary circumstances may the DAC recommend continuation without support.

- Continuation as a graduate student, but with a warning that progress is not completely satisfactory. Areas of expected improvement should be clearly indicated, a timeline for remedying any deficiencies should be stated, and the means of communicating progress to the DAC (e.g written report or DAC meeting) should be described.

- Termination as a graduate student one term after the unsatisfactory progress warning has been issued, if their progress is not deemed completely satisfactory by the DAC. A student not recommended for continuation by the DAC may appeal this recommendation to the Graduate Affairs Committee.

A copy of the committee's report is to be placed in the student's file and a copy given to the student. The student's progress report will also become part of the student's permanent record.

APPLICATIONS FOR TRAINING GRANT SUPPORT

Several training grants are available to support a subset of Ph.D. students in the Biology Department. An email soliciting applications to these training grants will be sent to all first year graduate students in early May. Each student should discuss with her/his prospective dissertation advisor which, if any, of these training grants is appropriate to apply for, taking into account the nature of the planned thesis project and whether the advisor is listed as a "trainer" on the grant.

REQUIRED RESEARCH CLEARANCE FOR MASTER'S THESIS/PROJECT OR DOCTORAL DISSERTATION

The Graduate School requires that all students using human or animal subjects in their research obtain permission (and a protocol number) from either the Office for Protection of Human Subjects or the Office of Veterinary Services and Animal

Care before beginning data collection. **Failure to follow these procedures may result in a recommendation to the Dean of the Graduate School that the University not accept your thesis, project, or dissertation.** Protocol forms and a detailed explanation of procedures may be obtained from:

Research Compliance Services
http://orcr.uoregon.edu
(541) 346-2510

Animal Care Services
http://acs.uoregon.edu
(541) 346-4958

SECOND-YEAR PROPOSAL EXAMINATION

In the second year, all Ph.D. students will take the Second-Year Proposal Examination.

For students taking the proposal examination in OIMB and IE^2, there are three possible outcomes:

PASS -- Satisfactory performance as determined by the proposal exam committee.

REVISE – Specific points brought up by the exam committee must be addressed within a set amount of time determined by the committee. The committee will evaluate whether the revision is adequate.

FAIL – An unsatisfactory exam will allow for an automatic retake within a time frame set by the exam committee. The exam committee will specify the basis for the retake and make suggestions for improving the exam. Students may request that a specific faculty member be replaced on the retake exam committee. No more than one member of the committee can be replaced at the student's request, and the replacement must be approved by the GAC. This request should be submitted in writing to the GAC at least three weeks prior to the retake exam. Other members of the exam committee may also be changed, at the GAC's discretion. A student may call a meeting of their DAC to discuss options available to them if they feel they do not want to retake the proposal exam.

For students taking the IMB and ION proposal exams, the Exam Committee Chair will report on the exam using the template below. This report will be distributed to the student, the home department for the student's file, and the thesis advisor.

1. Statement of broad and specific questions (logic, clarity, etc.)
Unsatisfactory Satisfactory Excellent

2. Statement of significance (logic, clarity, etc.)
Unsatisfactory Satisfactory Excellent

The exam requires defining one or more **hypotheses**, which should the most reasonable answer(s) to the proposal's specific question based on what is already known. Any hypothesis must be justified by linking it to prior observations.

3. Statement of hypothesis (logic, clarity, justification, etc.)
Unsatisfactory Satisfactory Excellent

The exam requires development of an **experimental approach** that rigorously tests the hypothesis

4. Experimental approach
Unsatisfactory Satisfactory Excellent

The student should have a command of background knowledge relevant to their proposal, broadly defined.

5. Knowledge of relevant background material
Unsatisfactory Satisfactory Excellent

Please provide comments addressing any issues for items 1-5 above, or other items that warrant mentioning (e.g. quality of writing, etc.).

- Any aspect of the exam deemed "unsatisfactory" must be addressed through a remedy prescribed by the committee. For example, the student may be assigned a rewrite of the hypothesis to improve the justification. If a significant portion of the exam is unsatisfactory, a complete retake may be warranted.

For all students, if a student does not pass the retake, the student's DAC will meet with the exam committee, review the student's file, and meet with the student soon after the second unsatisfactory proposal exam to discuss the situation and possible routes for the student. The student's performance in the laboratory, in courses, on quarterly exams, and in teaching will all be considered by the DAC in developing a recommendation. Unless performance outside of the exam context has been exceptional, it is likely that the DAC will recommend that the student leave the program. However, under some circumstances, the DAC could recommend that the student take the proposal exam again. Students who fail the proposal exam may be eligible to receive an M.S. degree upon recommendation of the exam committee and their DAC.

Additional aspects of the Second-Year Proposal Examination that are specific to each research unit are discussed separately below.

IMB

The proposal exams for second-year Biology students in IMB will take place during **winter term** during the 2015-16 Academic Year. Students will write and defend a hypothesis-driven proposal **on a topic that is closely related to their thesis research**.

The examination committee will consist of four tenure-track faculty members, at least two of whom are from the Biology Department. To avoid any possible conflicts of interest, the dissertation advisor may not serve on the committee. The student taking the exam will choose one member of the proposal exam committee. The purpose of this is to allow the student to choose a faculty member who can provide expertise in the area of the proposal, and thus facilitate exam discussion. **The student's choice for the exam committee member must be submitted by email to Gabrielle Andrew (gandrew@uoregon.edu) by 11/13/2015.** The Graduate Affairs Committee member from IMB will appoint the other exam committee members and designate the chair. **Exams will take place between February 15 and March 1, unless there are extenuating circumstances**.

The purpose of the exam is to assess the student's background knowledge and ability to develop a hypothesis-driven research proposal on a topic that is closely related to their thesis research. The proposal should test a compelling hypothesis (or alternative models). Many thesis projects, especially at the outset, are exploratory and do not involve testing a specific hypothesis. ***Therefore, students should not limit themselves to their precise thesis project.*** Students should resist the temptation to force an exploratory project into the "hypothesis" format for the purpose of this exam. If their current research is not a good fit for this format, students should develop and test a compelling and substantive hypothesis that draws on similar background literature and methods as their thesis research. If students wish to get feedback on the suitability of their hypothesis, they can discuss this with their thesis advisors, and they have the opportunity to submit an Abstract for comments in early January. (See below).

Communication between the student and PI. The advisor should mentor the student as they would if the proposal exam were separate from the thesis research. That is, the advisor and student should freely discuss questions, hypotheses, approaches, and literature relevant to the student's thesis research. However, the advisor may not see or comment on any draft of the written proposal (or oral presentation), and may not suggest specific wording, diagrams, etc. for the written or oral part of the exam.

Proposal Summary/Abstract: Students who would like feedback on the general direction of their proposals may submit a Proposal Abstract to the IMB Graduate Oversight Committee (currently Alice Barkan and Diane Hawley) no later than Jan. 4, 2016. Abstracts received after that date will not be reviewed.

Abstracts should be no longer than one page and should:

- Summarize the key pieces of evidence that lead to the question/hypothesis, and then concisely state the question/hypothesis that the proposal will address.

- Break the large question down into several smaller questions that will be addressed by the proposed experiments.

- Provide a general and brief description of the approaches that might be taken to answer the questions that are posed.

Abstracts will be evaluated by two IMB faculty (but not the advisor). Feedback will be provided by Monday, January 11, 2016, and will focus on whether the hypothesis being tested is justified based on prior observations noted in the Abstract, as well as whether the scope and significance of the plan are suitable for this exam.

Format of Written Proposal:

The proposal should be no longer than 5000 words (excluding references and figures). We encourage the use of diagrams as needed to summarize/explain the background and experimental plan.

The proposal should include:

- an introduction that clearly states the specific biological problem the proposal is addressing. A broad ("big picture") problem should be introduced, along with the more focused question the proposed research is designed to address. The significance of the research problem (i.e. how answering the focused question will contribute to the broader question) should be stated.

- an explicitly stated hypothesis or alternative models, along with a justification (i.e. a logical argument supporting the hypothesis based on what is already known – including the student's own data or unpublished data from their lab).

- a specific aims page that outlines the experiments to be performed in the context of specific questions that, if answered, will allow the hypothesis to be evaluated.

- a description of the experimental approach, including a discussion of how various possible results will be used to evaluate the hypothesis/models.

- clear figures that help convey the important points of the proposal. (These are not counted toward the word limit.)

For the oral part of the exam, the student should prepare a 30-minute presentation that includes the same key elements as the written form of the proposal.

The proposal and oral defense will be evaluated with the following criteria:

Background knowledge. Is the student knowledgeable about previous studies that are relevant to the project? This relevance is broadly defined – for example, if the project examines a process in Drosophila, is the student also familiar with relevant work done in other systems? Is the student well versed in the techniques required to complete the proposed research?

Choice and statement of research question. Is the research question clearly stated in both broad and specific terms? Is it a substantive question that, if answered, will move the field forward significantly? Is it of the appropriate scope (i.e. can it be answered by a single skilled researcher in a period of ~4 years)? Is a clear and logical connection made between the broad and specific question to establish the significance of the proposal?

Hypothesis or alternative models. Is a clear hypothesis, or alternative models, presented? Is the hypothesis tightly coupled to the specific research question? Is the hypothesis justified based on core knowledge and previous studies?

Experimental approach. Are experiments clearly described? Are experiments feasible? Do experiments clearly test the hypothesis (i.e., will the results support/refute the hypothesis or distinguish between models)? Are the most suitable approaches proposed? Are suitable controls included? Are limitations of the proposed approaches considered?

Passing the exam requires satisfactory completion of each of these key elements.

IE^2

Students planning to carry out dissertation research in an IE^2 lab must take the IE^2 proposal exam. This exam will be administered during winter term of the second year. For this exam, students will write and defend a proposal on the research they intend to do for their dissertation. The proposal should be **no more** than 8 pages in length, including text and figures but excluding references. This is essentially the format for the NSF Doctoral Dissertation Improvement Grant, but no Broader Impacts section is required. Page limits will be enforced by the proposal exam committee.The oral defense portion of this exam will also include a test of general knowledge in ecology and evolution.

The exam committee will be composed of four faculty members, at least two of whom are members of IE^2 familiar with the research being proposed. Insofar as possible, there should be significant overlap between the examination committee and the names proposed for the student's DAC. In the event that a proposed DAC member is unable to sit on the proposal exam committee, the student, the IE^2 GAC representative, and the student's advisor will work together to find a suitable replacement. Unlike proposal exams in other research groups, this proposal will be developed in consultation with the dissertation advisor and anyone else the student desires to consult. A major function of this exam is for students to develop a clear plan for their dissertation research and to present it publicly.

Although your major advisor cannot participate in the exam as an examiner, he/she is allowed to watch as a completely silent observer. The exam will begin with an oral presentation of the proposal; this will be open to all members of IE^2, including students. The student's presentation will be followed by a public question and answer session. The remainder of the exam will be closed to all but the student, the examining committee, and the advisor (as a silent observer). The public portion of this exam will not exceed one hour; the closed portion will not exceed two hours. The exam will take place during the second half of winter term (i.e. weeks 6-10) The written proposal must be given to all committee members, and to Gabrielle Andrew, no later than two weeks prior to the scheduled exam date. Gabrielle will schedule the examinations by the end of the first week of winter term. This exam will be graded using the pass/revise/fail rubric, as described above. A student who does not pass this exam has the same options described above for students who do not pass proposal exams in IMB/ION.

ION

Students will write, and defend in an oral presentation, a proposal on the research they intend to do for their dissertation. The written component shall follow the content, page limitations, and formatting guidelines of the National Research Service Awards for Individual Predoctoral Fellows (F31), as spelled out in the *Detailed Instructions for ION Proposal Examinations*.

The examination will proceed in three phases according to the following schedule.

1. Nov 15: Submission of the Specific Aims page (emailed to ION GAC representative).

2. One week prior to defense date: Submission of the Research Plan and final Specific Aims page (emailed to ION GAC rep. and the student's DAC).

3. Mar 15: Last day for public defense of the proposal.

The exam committee will be composed of the student's DAC, minus the thesis advisor.

This proposal will be developed in consultation with the thesis advisor and anyone else the student desires to consult. A major purpose of this exam is to help students develop a clear plan for their dissertation research and to improve their skills in oral presentations. Another purpose is to encourage submission of actual NRSA proposals.

The exam will begin with an oral presentation of the proposal (1 hour maximum); this will be open to all members of the research community. The presentation will be followed by a public question and answer period. The remainder of the exam (1 additional hour maximum) will be closed to all but the student and the student's DAC (minus the thesis advisor).

The proposal will be scored according to NIH's Criteria and Considerations for Research Project Grant http://grants.nih.gov/grants/peer/critiques/rpg.htm#rpg_01. The catagories to be scored are Significance, Approach, and Overall Impact. The oral presentation will be scored for clarity and execution. A passing grade does not necessarily mean that the proposal should be submitted to NIH. That decision will be made by the student's thesis advisor in consultation with the DAC.

OIMB

Students planning to carry out dissertation research in a lab at OIMB must take the OIMB proposal exam. The student will prepare a dissertation proposal, describing the intended dissertation research, and encompassing the entire dissertation as envisioned at that time. The proposal should be prepared according to the general guidelines (1-7) outlined in this handbook. The proposal should follow the NSF format and should not exceed 15 pages of text and figures.

The proposal must be submitted to the student's DAC members by the end of the first week in January in the student's second year. The oral exam will take place by the end of January, year two. The DAC will serve as the examining committee, and the chairperson of the DAC will also be the chair of the exam committee.

The exam will focus on the dissertation proposal, but may proceed with questioning that moves from the particular proposal to more general topics. The DAC, being familiar with the student's performance on the quarterly exams, will evaluate the student's background accordingly. The categories of examination outcomes (Pass, Revise, Fail) and subsequent actions are as described earlier in the Graduate Student Handbook.

ADVANCEMENT TO CANDIDACY

Once the student has passed the quarterly exams and proposal exam, met the teaching requirement, met course requirements, and has begun to make satisfactory progress in the chosen lab (as determined by the advisor, the DAC and the GAC), the student will be advanced to candidacy. The decision to advance to candidacy will usually be made by the end of spring term in the second year. At this time, the department head will forward the DAC membership to the graduate dean. The graduate dean will then officially appoint the DAC. *If the student is not making satisfactory progress in the chosen lab by the end of spring term following their qualifying exams, they can then be dismissed from the program* (see Advancement to Candidacy).

Advancement to candidacy is a formal step that indicates that all requirements for the Ph.D. degree, except completion and defense of a dissertation, have been met. It typically occurs at the end of the second year, but will be delayed if teaching has been deferred or other requirements have not been fulfilled. The DAC will recommend that a student be advanced to candidacy when:

1. Three quarterly exams and three rotations have been completed with satisfactory evaluations.

2. The proposal exam has been passed.

3. The teaching requirement has been fulfilled. Evaluations from supervisors will be used, in part, to determine if this requirement has been met.

4. Courses required by the advisory committees (IAC, QARC and DAC) have been taken, or a plan for their completion has been approved by the DAC.

5. A GPA of 3.0 or better has been maintained for graded credits, with no incompletes. A grade of P is required in all required courses taken P/NP.

6. The second year DAC meeting will focus on the student's ability to perform independent research. At this meeting, the DAC (including the advisor) will evaluate whether or not the student is motivated, working hard, reading the literature, thinking, and having some successes with research. If this meeting is positive and the criteria above have been met, the DAC will recommend advancement.

7. The final decision to advance a student to candidacy will be made by the GAC and Graduate School after considering all six criteria above.

Note: It is only after advancement to candidacy that a student may take dissertation credits (BI 603) – see summary of departmental regulations for graduate students at end of handbook.

EVALUATION OF PROGRESS

Regarding incomplete grades: at any one time, a student shall have no more than two incompletes. All incompletes shall be completed within one year of incurring them. No student can be advanced to candidacy until they have cleared all incompletes from their transcript. Only BI 603 Dissertation or BI 503 Thesis should show as 'incompletes' on the transcript. The Graduate School is responsible for changing those grades at the time of degree completion.

First Year

Quarterly evaluation of first year students is completed by the QARC.

In addition, near the end of the first year (or possibly during summer term), Gabrielle Andrew and Graduate Affairs Committee (GAC) review the files of each first year student to ascertain whether or not the student has made satisfactory progress. The criteria for satisfactory progress include:

1. Satisfactory quarterly evaluations by the QARC.
2. Three laboratory rotations have been completed with satisfactory evaluations.
3. Satisfactory teaching evaluations.
4. GPA of 3.0 or better in graded coursework and no grades of NP or I.
5. Grades of B- or better on 3 quarterly exams, with no more than one B-.
6. Identification of a thesis advisor by the end of the summer of year one.

Other issues might arise that are deemed unsatisfactory; if so, these will be documented in writing. Exceptions to these criteria may be made by the GAC if there are extenuating circumstances.

Second Year and Beyond

In the second and subsequent years, the GAC and Gabrielle Andrew review progress toward the Ph.D., and the GAC makes recommendations about continuation in the program. The responsibility for demonstrating satisfactory progress is primarily in each student's hands, and secondarily in those of the advisor and the DAC. The criteria for satisfactory progress for years 2 and beyond include:

1. Grade of 'Pass' on the proposal exam (year 2).
2. Satisfactory progress in dissertation research, as determined by the dissertation advisor and DAC.
3. GPA of 3.0 or better in graded coursework and no grades of NP or I.

Failure to meet these criteria for each year will trigger a detailed review by the Graduate Affairs Committee and may result in termination from the program.

Students must meet with their DAC at least once each year, and must provide written progress reports at least four days prior to their meeting to: 1) each member of their DAC and 2) Gabrielle Andrew, who will place these in their file for review by the GAC. The required contents of the report are explained above. The GAC cannot recommend continuation unless the progress report, the report of the DAC chair, and the recommendation of the DAC are on file by the deadline specified above. **It is the responsibility of the student to notify Gabrielle Andrew as soon as the meeting time is set so that reminders may be sent to the committee.**

DISSERTATION PREPARATION AND TIMETABLE

Preparation of a written dissertation takes a considerable amount of time. It is strongly recommended that the student meet with the DAC before writing begins, but after all planned experiments are completed, to ensure that the committee agrees that the experimental work is complete. This meeting should take place three to four months prior to the planned defense. Writing should be done in conjunction with the dissertation advisor, and a polished, well-prepared version of the dissertation must be given to the members of the DAC at least three weeks prior to the scheduled defense.

The Graduate School provides a website to aid in the process of completing requirements for the dissertation defense. There the student will find instructions relating to the process of completing the degree (forms to use, etc.). If a student wishes to include in their dissertation substantial portions of material that has been published with or without co-authors, or is intended to be published with co-

authors, then s/he must seek permission from their DAC and the Graduate School at least one term prior to scheduling their defense. If the student plans to submit a dissertation in journal format style, they must obtain approval from the Graduate School at least one term prior to the defense.

Students must register for a minimum of 3 credits of BI 603 Dissertation both the term before and the term of their defense (with a total of at least 18 credits). Once the student applies for their degree and then applies for their final oral defense online (through GradWeb), DAC committee members are automatically requested to indicate their agreement to attend. This process may take some time to complete, so begin the process as soon as possible. **It is recommended that you meet with Gabrielle Andrew, as soon as you have decided on a term for graduation, to make sure that everything is in order.**

FINAL ORAL EXAMINATION

This shall consist of an open and public research seminar, followed by a private session of the candidate with members of the DAC. During the public presentation, the candidate should be prepared to defend the dissertation by responding to questions from the audience. The private session with the DAC will serve as the formal final examination. The time alloted for the defense varies by institute:

IMB – 1.5 hours

ION – 2 hours

OIMB – 1.5 hours

IE^2 – 3 hours

If more time will be needed, the student should discuss this with their committee and then make sure that the room is reserved for the correct amount of time. At least 15 minutes will automatically be added to this time for the student to set up and prepare for his/her defense before the scheduled start time. Gabrielle Andrew will query each student to determine if they require more 15 minutes and, if so, that time will be added to the total time a room is reserved for the defense. Rooms are reserved through the Biology Secretary (Annie Rogers). For the best selection of rooms, contact Annie as soon as a date and time is selected.

STUDENTS ENTERING WINTER OR SPRING TERM

While most Ph.D. students begin their program of study during fall term, occasionally a student will arrange to begin during a different term. For those students, the following schedule will apply:

Winter Term Admit

Aside from rotations and associated activities, the student will be treated as a fall term student of the current school year, and will be expected to take quarterly exams winter and spring terms. Those rare students who begin in winter term will have the option of taking their proposal exam the following winter term rather than fall term. If the student chooses to delay their proposal exam, they will take their third quarterly exam fall term. Otherwise, they will take their proposal exam in the fall term and their third quarterly exam in winter term. They should further discuss their plans with both the chair of the Graduate Affairs Committee and Gabrielle Andrew early in September.

Spring Term Admit

Aside from rotations and associated activities, the student will be treated as a fall term admit for the coming school year. Thus, they will be expected to take their quarterly exams during the following fall, winter and spring terms, and they will take their proposal exam during fall term of the following year.

SUMMARY OF DEPARTMENTAL REGULATIONS FOR GRADUATE STUDENTS

Students should consult the University Catalog for general requirements of the Graduate School. The following are additional requirements as stipulated by the Department of Biology, or are clarifications of Graduate School policies.

1) Course load

a) Prior to advancement to candidacy, it is recommended that graduate students take a full course load (16 credit hours) during fall, winter and spring terms. These credits include the required Laboratory Rotation Program during the first year, dissertation research during subsequent years, seminars, journal clubs, and courses either required or recommended by the DAC. **Most students need not register for Summer term. Students should check with their advisor and Gabrielle Andrew BEFORE registering for summer term to determine whether they should register and, if so, for how many credits.**

b) After advancement to candidacy, all students should register for 9 credits each term unless they are advised to do otherwise by their advisor/DAC. Students in the Biology PhD program are required to register for one journal club each quarter, and for one or two seminars (depending on the research unit). Advanced students may also register for courses as needed to satisfy requirements imposed by training grants or the DAC. Registration for any additional courses will require approval of the advisor.

c) Students working toward a Ph.D. must complete a minimum of 18 hours of Dissertation (BI 603) before their degree can be awarded. They may

register for these hours anytime after advancement to candidacy, but MUST be registered for a minimum of 3 credits of Dissertation (BI 603) both the term prior to and the term in which the student plans to defend. For a fall term graduation, the "term before" is spring (not summer).

2) Continuous enrollment

a) A full-time graduate student is required to be enrolled during each term of the regular academic year from the time of first enrollment until his/her degree is awarded. A student is enrolled as either a student in residence, or a student on leave of absence (no fees charged).

b) If a student fails to maintain continuous enrollment, s/he will be considered as withdrawn. If such a student wishes to renew studies, he or she must reapply for admission.

3) Financial Support

a) Financial support is guaranteed for four years provided the student is making "satisfactory progress" toward the Ph.D. degree. Progress is assessed by the GAC on an annual basis.

b) Financial support is usually limited to Ph.D. candidates.

c) A student receiving financial support is:

1) expected to devote full time to his or her graduate studies and teaching or research duties,

2) not to be otherwise gainfully employed within or outside the university. In cases of financial hardship, the Graduate Affairs Committee should be consulted. It may waive this rule or make other arrangements.

GUIDELINES FOR A THESIS MASTER'S DEGREE

The guidelines in this section are primarily for master's students in OIMB and IE^2. However, the information about graduate school requirements, deadlines, scheduling, and the role of the advisor and committee apply to students in any of the other research units.

The thesis is the end result of independent research and must be written according to the UO Graduate School requirements as set forth in the *Style Manual for Theses and Dissertations.*

You should also familiarize yourself with the Graduate School requirements for a MS degree with thesis. These can be found on the Graduate School website: http://gradschool.uoregon.edu/node/216

To summarize these requirements, you need:

1) A total of 45 graduate level credits, 24 of which must be graded and taken while in residence at the UO.
2) At least 30 hours must be in graduate-level Biology courses.
3) Nine of these 45 credits must be BI 503 thesis, and 9 must be taken at the 600-level.
4) Maintain a 3.00 GPA.
5) For a Master of Science, there is no language requirement.

IE^2 Master's with Thesis Track

Students in the track should form a committee comprised of a tenure-track advisor and two other members holding a doctoral degree, at least one of whom must be a faculty member outside of the lab. They should meet with their committee at least a year in advance of their anticipated completion date to present their proposed research. At this meeting, members of the committee should contribute critical positive suggestions concerning the proposed research and also make clear their expectations for satisfactory completion of the degree.

Students should submit to their committee for preliminary approval a rough, but complete, draft of their thesis at least six weeks in advance of their defense. This timing will allow corrections to be made, if necessary. The formal, final version of the thesis must be sent to their committee at least one week in advance of their defense.

OIMB Master's Program Schedule

Satisfactory performance is required for continuing participation in the Master's Program. The following outline is the ideal sequence of events for a MS student at OIMB. There will be exceptions to this sequence. Some students will need to have

individualized programs based on this structure, but with a different timetable. Such students must discuss deviations from this outline with their advisor and formalize a specific timetable.

Fall Term 1

Coursework – Enroll in appropriate OIMB courses in consultation with the advisor.

Seminars – Attendance and participation in a graduate seminar is required during each term in which a student is registered unless field work requires that the student be away from OIMB. Students who are registered at the University solely for the purpose of defending their thesis, who are not living nearby, and who are not regularly working at OIMB, need not attend seminar during the quarter in which they defend. Attendance at the Marine Biology seminar on Friday afternoons is also very strongly encouraged.

Winter Term 1

Coursework – Possibly take courses in Eugene. If in Eugene, attendance and participation in a graduate seminar or journal club is required.

Research – Continue exploration of potential research topics. By the end of this term, students should have confirmed their research questions with their advisor.

Spring Term 1

Coursework – Possibly take courses in Eugene. If in Eugene, attendance and participation in a graduate seminar or journal club is required.

Research – Establish a thesis committee, prepare a thesis proposal (see below), and meet with committee regarding the planned research. **Deadlines: By May 15**, establish a 3-person committee, one of whom is the advisor. Also complete the research proposal and have it approved by the advisor. **By May 21**, the thesis advisory committee should have received a copy of the research proposal. **By June 1**, the student should meet with their committee to discuss the research proposal and their overall progress.

Summer Term 1

OIMB courses where appropriate, Marine Biology seminar.

Initiate research if not already started.

Fall Term 2

OIMB courses only if appropriate. Grad seminar and marine biology seminar.

Devote as much time as possible to research.

Winter Term 2

Grad seminar. Continue research.

> **By January 15:** Submit a written progress report on research to the committee.

By February 1: The student should have met with their committee to discuss completion of their degree. At this meeting, research findings and plans for completion will be discussed. The student should outline a schedule for completing their research and writing their thesis.

It is imperative that the student establish a schedule agreed upon by their committee **by February 1**, as many deadlines for revisions, and for submitting documents to the Graduate School must be met in the final (spring) quarter.

Spring Term 2

Grad seminar. Research.

Thesis preparation, defense, graduation.

Thesis Preparation

This schedule applies for any quarter the student plans to graduate. The first drafts of the thesis should be given to the advisor on a schedule to be set up between the advisor and the student. After revisions have been incorporated and the draft approved by the advisor, the student needs to give this draft to the other members of their thesis committee for their feedback and comments. Upon receiving approval of this draft from each committee member, the student may schedule their thesis defense. A revised, penultimate draft of the thesis should be given to all committee members **one week** prior to defending. The public defense should be scheduled **no later than three weeks prior** to the Graduate School deadline for submission of thesis. **No later than one week after** the defense, the student should give the final version of their thesis to their advisor for final approval.

Writing a Thesis Proposal

A proposal should consist of a coherent presentation that includes an Introduction, Statement of Questions or Hypotheses Addressed, Background (if necessary), Methods and Experiments, Expected and Possible Outcomes, Significance, Timetable, and Literature Cited.

- ✓ The Introduction should review the topic that will be addressed in the proposal and include a reasonably thorough literature review of prior studies. The goal of the Introduction is to set up a perspective from which to view the planned research work. Students should avoid discussing every approach or fact known about their planned topic.

- ✓ A Statement of Questions should concisely state the questions to be answered or hypotheses to be tested.

- ✓ Background can contain any additional information necessary to supplement the Introduction and which is necessary to introduce or justify the methods and experiments.

- ✓ Methods and Experiments should outline specific experiments or observations to test the hypothesis or hypotheses (or distinguish among alternative hypotheses) mentioned after the introduction. The materials to be used, the exact design of experiments, descriptions of the data to be collected, and methods of analyzing that data, including statistical tests, should all be covered in this section.

- ✓ Expected and Possible Outcomes should outline the possible outcomes of the planned experiments or observations. The relationship between these outcomes and rejection or confirmation of the hypotheses should be made explicitly.

- ✓ Significance of the proposed research should cover the uses of information gained in the research. The relevance of the research and the answer(s) it yields need to be set into context of science in general and the specific areas of science that the thesis research addresses.

- ✓ Timetable should report the schedule to accomplish the experiments and analyze the results, and prepare a thesis. Give appropriate supporting information about start and end times, or how long an experiment is expected to run. Try to give realistic estimates of time to analyze results.

- ✓ Literature Cited should include complete references to all literature cited in the proposal -- see a journal or style manual for format.

When you prepare your proposal, consider whether the following are addressed, as these will be the criteria for evaluating your proposal:

1) Is the problem (or set of closely related problems) clearly and briefly stated?
2) Is there a clear, concise, and complete statement of the hypotheses or models?
3) Are the hypotheses or models reasonable? Does the proposal demonstrate knowledge and understanding of the area?
4) Is the general outline or plan of the experimental or observational approach clearly stated? What experiments or observations are planned, and what are the possible and expected outcomes?
5) What can be concluded about the hypotheses or models from the possible outcomes of the experiments? Are new hypotheses or experiments and observations necessary?
6) Are various details of the experiments or observations handled adequately (e.g., feasibility, statistical significance, controls, etc.)? Does the proposal demonstrate knowledge and understanding of the particular area?

7) The written proposal should not exceed 3,500 words.

Role of the Advisor

The thesis advisor is the OIMB permanent faculty member most responsible for the oversight of research and preparation of the thesis. That person should be the mentor and should be very closely familiar with the work and research plan of each Master's student. Besides providing guidance and feedback in all aspects of the research plan and its execution, it is the responsibility of the advisor to establish with the student a reasonable timetable for obtaining a Master's degree.

Role of the Thesis Committee

The 3-member committee (including the advisor) is responsible for evaluating the academic performance of the student, thesis proposal, and the thesis resulting from independent research conducted by the Master's student. The choice of members of the committee should be made according to the research and educational goals of a Master's student. Committee members should be viewed as important resources for proposal execution and evaluation. It is up to the student to tap the resources. Membership on this committee should be discussed between the advisor and student prior to its appointment.

The thesis committee must approve the thesis proposal and the thesis. Each member of the committee is expected to actively participate in the project execution and evaluation, and should voice their opinions throughout thesis work.

Master's students may have more than one advisor but, if the student's degree is in Biology, at least one of the advisors who is a tenure-track faculty member in Biology, must sign the official paperwork; other committee members who are co-advisors may also sign the official documents.

– APPENDIX –

Detailed Instructions for ION Proposal Examinations

1. Specific Aims (1 page)

State concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that the results of the proposed research will exert on the research field(s) involved.

List succinctly the specific objectives of the research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology. Most proposals have 2-3 distinct objectives.

Only a small number of essential citations should be included.

2. Research Strategy (6 pages)

Organize the Research Strategy in the specified order using the instructions provided below. Start each section with the appropriate section heading — Significance, Preliminary Studies, and Approach. Cite published experimental details in the Research Strategy section and provide the full reference in the Bibliography and References Cited section.

(a) Significance

Explain the importance of the problem or critical barrier to progress that the project addresses.

Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.

Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

Describe the project's relevance to human health.

(b) Preliminary Studies

Provide a succinct account of published and unpublished results, including those that validate any of the strategies or methods used in the Approach. In the third-year Proposal Examination, it is expected that at least some of the preliminary findings will have been obtained by the student; clearly indicate the source of any unpublished findings.

(c) Approach

For each Specific Aim, describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted.

Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims. If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.

If an applicant has multiple Specific Aims, then the applicant may address Significance, Preliminary Studies, and Approach for each Specific Aim individually, or may address Significance, Preliminary Studies, and Approach for all of the Specific Aims collectively.

3. References Cited (not included in page limits)

Mandatory formatting instructions

Submission

Submit the Specific Aims, Research Strategy, and References Cited as a single PDF document.

Font

Use an Arial, Helvetica, Palatino Linotype, or Georgia typeface, a black font color, and a font size of 11 points or larger. (A Symbol font may be used to insert Greek letters or special characters; the font size requirement still applies.)

Type density, including characters and spaces, must be no more than 15 characters per inch. Type may be no more than six lines per inch.

Recommended: Ovoid use of justified right margins, which make word-processor text harder to read than non-justified right margins.

Paper Size and Page Margins

Use standard paper size (8 1⁄2" x 11).

Use at least one-half inch margins (top, bottom, left, and right) for all pages. No information should appear in the margins, including the PI's name and page numbers.

Page Formatting

Do not include any information in a header or footer of the document, except your name and page numbers.

Figures, Graphs, Diagrams, Charts, Tables, Figure Legends, and Footnotes

You may use a smaller type size but it must be in a black font color, readily legible, and follow the font typeface requirement. Color can be used in figures; however, all text must be in a black font color, clear and legible.

Grantsmanship

Use English and avoid jargon. Eschew all but the most familiar acronyms. Assume a familiarity with the literature at the level of an educated non-specialist. Obtain copies of successful proposals from students, and NIH grant applications from PIs to use as models. Pay attention to all details of execution including prose, spelling, layout, and graphics. Show the reviewers that you are a perfectionist.

Useful reference material:

The Elements of Style, by W. Strunk and E. B. White.

Fowler's Modern English Usage, by H. W. Fowler.

Writing the NIH Grant Proposal: A Step-by-Step Guide, by W. Gerin et al.

Recommended template for Research Strategy

(a) Significance

Challenge. Give the background needed to understand the nature and importance of the scientific questions you plan to address. State the issues or questions your experiments will address. Explain why your finding will be important to the field.

Barriers to progress. Describe the state of the field in your topic area with particular emphasis on the what has been holding the field back. Explain briefly in general terms how you propose to overcome these hurdles.

(b) Preliminary studies

Provide a succinct account of published results. Include those findings that set up your questions. Also include results that prove the workability of any of the strategies or methods proposed in the Approach.

(c) Approach

For each Specific Aim, include the following subsections:

Rationale. Explain why does this particular experiment need to be done. Describe the specific hypothesis you are testing if appropriate.

Approach. Describe the experiment you will perform. Include the materials, procedures (including statistics), methods, and manipulations that will are involved in the experiment.

Interpretation. Describe the range of results you expect, and how you will interpret the outcomes relative to your hypothesis.

Limitations & alternatives. Imagine 2-4 things that what could go wrong in the Approach, and what countermeasures are available in each case.

What we will have learned. At the end of the Approach, explain the broader impact of your findings if each Aim is successful.