DEPARTMENT OF BIOLOGY
GRADUATE STUDENT HANDBOOK
2021–2022

The following abbreviations are used in this handbook:

CDB: Center for Developmental Biology
DAC: Dissertation Advisory Committee
GAC: Graduate Affairs Committee
IAC: Interim Advisory Committee
ION: Institute of Neuroscience
IE^2: Institute of Ecology and Evolution
IMB: Institute of Molecular Biology
IDP: Individual Development Plan
INGP: Interdepartmental Neuroscience Graduate Program
OIMB: Oregon Institute of Marine Biology
QE: Quarterly Exam

Note: The Interdepartmental Neuroscience Graduate Program (INGP) is an umbrella organization that hosts students from multiple departments including biology. The Institute of Neuroscience is a research institute containing many, but not all, of the laboratories hosting INGP students. All biology students doing neuroscience research are automatically a member of INGP, unless they elect otherwise. Biology students in INGP are expected to meet the requirements of both the Department of Biology and the INGP, as specified in this document.

Key Biology Department contacts (2021–2022):

Graduate Program Manager: Jen Strong (jsstrong@uoregon.edu)
Graduate Program Assistant: Gabrielle Andrew (gandrew@uoregon.edu)
INGP Graduate Affairs Rep: Shawn Lockery (shawn@uoregon.edu)
IMB Graduate Affairs Rep: Eric Selker (selker@uoregon.edu)
OIMB Graduate Affairs Rep: Kelly Sutherland Emlet (ksuth@uoregon.edu)
IE^2 Graduate Affairs Rep: Andrew Kern (adkern@uoregon.edu)

The majority of this handbook is applicable only to students entering the PhD program. Students entering the MS program should refer to the Guidelines for a Thesis Master's Degree section of this handbook, as well as the Master's Degree requirements and policies on the Graduate School's website.

ORIENTATION

A series of orientation activities for incoming graduate students will take place 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 required training in lab safety, CPR, first aid, teaching engagement, responsible conduct of research and conflict resolution, as well as 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 dates 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 (360 Oregon Hall; 346-1155 or uoaec@uoregon.edu). They will work with you to help facilitate your learning experience.

HARASSMENT AND DISCRIMINATION

It is the policy of the University of Oregon to maintain an environment free of prohibited harassment and discrimination against any person because of age, veteran status, race, sex, color, sexual orientation, ancestry, gender identity, national or ethnic origin, perceived gender, religion, marital or family status, gender, pregnancy-related conditions, disability, genetic information, service in the uniformed services, and the use of leave protected by state or federal law. This includes harassment of, or discrimination against, undergraduates, graduate students, faculty, staff, and any other instructional or research personnel (for example collaborators during field work).

All members of the university community (including graduate students) should become familiar with the University of Oregon's anti-discrimination policy, which can be found at https://policies.uoregon.edu/vol-5-human-resources/ch-11-human-resources-other/discrimination-complaint-and-response

The University of Oregon's Office of Investigations and Civil Rights Compliance will investigate complaints of harassment or discrimination, and acts of harassment or discrimination may result in expulsion from the university.

INTERIM ADVISORY COMMITTEE

The Graduate Affairs Committee (GAC) will appoint an Interim Advisory Committee (IAC) for each new PhD student before the beginning of the first term in residence. The committee shall consist of two or three Department of Biology faculty members, 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, INGP, OIMB), and the committee includes at least one faculty member from the student's admitting institute. At the discretion of the Graduate Affairs Committee, special committees can be assembled for students whose interests span institute boundaries (e.g., tracks within CDB including Evo-Devo, Neuro-Dev, etc). A meeting between the student and the Interim Advisory Committee will occur before registration for the first term, typically during orientation week. 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. Recommendations for first-year course work will be provided. Students must register for a minimum of 9 credits and a maximum of 16 credit hours each term of the academic year (fall, winter, spring). First-year students typically register for 16 credits. For guidance about summer registration after the first academic year, students should consult with their advisor and the Graduate Program Assistant.

2) Advice will be offered to help the student choose lab rotations. It is understood that students will make decisions about winter and spring rotations after starting the program (these rotations do not have to be arranged prior to starting in the fall). The student is responsible for making arrangements for 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 this handbook.

Unless the student or Interim Advisory Committee requests an additional meeting, this committee meets only once with the student. The student will subsequently meet with the GAC member from their home research institute at the end of each quarter (fall, winter, and spring) to discuss their progress in the program.

COURSE REQUIREMENTS

Incoming students generally follow a specific series of courses depending on the Institute and/or specialty they are pursuing. Requirements for individual students may vary based on the recommendation of the IAC, advisor, and other committee members. Incoming students do not need to register until after their IAC meeting.

IMB students are required, in the **FIRST year**, to take *Molecular Genetics - Bi620* in the Fall and *Advanced Biochemistry - Ch662* in the Winter. This requirement also applies to IMB students associated with CBD – Developmental Track.

INGP students associated with CDB – Development Track are required, in the **FIRST year**, to take *Molecular Genetics - Bi620* in the Fall and are strongly encouraged to take *Advanced Biochemistry - Ch662* in the Winter. Students in this track are further encouraged to take the other Advanced Development courses as they are offered.

INGP students in the Neurons, Circuits & Cognition Program are required, in the **FIRST year**, to take *Advanced Cellular Neuroscience - Bi610* in the Fall, *Advanced System Neuroscience - Psy610* in the Winter, and *Advanced Cognitive Neuroscience - Psy610* in the Spring.

INGP students in the Theoretical Neuroscience Program are required, in the **FIRST year**, to take *Advanced Cellular Neuroscience - Bi610* in the Fall and *Advanced System Neuroscience - Psy610* in the Winter. In either the first or second year, students take one of the following combination of courses:

- either *Analysis of Neural Data - Bi4/510* or *Applied Math II: Statistical Learning - Math607*;
- either *Introductory Machine Learning and Statistics - Math4/510* or *Applied Math III: Machine Learning and Statistics - Math607*;
- and one of the following elective courses: *Machine Learning - Cis472/572, Probabilistic Methods for Artificial Intelligence - Cis573, Techniques in Computational Neuroscience - Bi485/585, Advanced Modeling in Biology - Bi410*, or another course approved by the student's IAC chair or research advisor.

Thus, there are a total of 5 courses required: *Bi610, Psy610,* and 3 chosen from the above lists.

All Biology PhD 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 the Graduate Program Assistant to request an exemption.

All Biology PhD students on the Eugene campus are required to attend research seminars. Each research institute sponsors a series of research seminars that 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 the Graduate Program Assistant to request an exemption.

All Biology PhD students on the Eugene campus are required to take *Ethics in Life Sciences Research – Bi610* during their **SECOND year**. This course is offered only one term each year. *Advanced Biological Statistics* is a two-part series and is recommended during year two (this course may be required for some students, as determined by the IAC, DAC, or advisor).

Interest Groups

There are many additional seminar-style interest groups that can be taken for credit. For example, "BI507: Sem Dev/Gen Zebrafish" in which all zebrafish researchers present seminars of their ongoing work, "BI607: Sem META" in which META Center researchers present seminars on their ongoing work, and "BI507: Sem Life Sci Trainees" in which graduate students and postdocs present their work. These offerings are generally taken on advice given by the IAC, advisor, and other committee members.

Other course requirements are set by the research institutes, the IAC, and DAC according to each student's interests and goals. Students who are selected to be supported by institutional NIH training programs may have additional course requirements.

Example 1st year quarter schedule

BI620: Molecular Genetics	4 credits
BI607: Sem Dev Biol Jour Club	1 credit
BI507: Sem Molecular Biology	1 credit
BI601: Res Neural Circuits (rotation)	10 credits
TOTAL	16 credits

Example 2nd year quarter schedule

BI610: Advanced Biological Statistics	4 credits
BI610: Ethics Life Science	1 credit
BI607: Sem Dev Biol Jour Club	1 credit
BI507: Sem Molecular Biology	1 credit
BI601: Res Neural Circuits (thesis)	9 credits
TOTAL	16 credits

The number of research credits is variable and depends on the number of seminars/journal clubs/etc. – take as many as needed to bring your total credits to 16.

Policy on Registering for Supervised College Teaching

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

LABORATORY ROTATION PROGRAM

Choosing an area of research for the PhD 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 immersion 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, and begin networking with faculty and other graduate students who will contribute to their research careers.

Specifically, the goals of the first-year rotation program are:

1) To provide a mechanism for students to establish a relationship with a mentor who will be their PhD advisor.

2) To allow students to experience different laboratory environments – providing insight into different organizational styles and intellectual approaches to research topics related to either interests

3) To provide training in different research methods and/or perspectives related to their research interests.

4) To enhance students' connection to the rest of the institute/department, ensuring that they are familiar with personnel (students, postdocs, technicians, and faculty members) and resources outside of their home laboratory.

It is common for rotation projects to engage the student in bench work, theoretical research, or fieldwork that advances particular research questions in the host lab. However, it is also acceptable for students to do other types of projects including, (but not limited to) writing a research proposal, meeting weekly with the PI to discuss research papers, writing a literature review, revising a previous manuscript, or applying unique methods from the rotation lab to research problems associated with another lab. In general, rotation projects should not be so personalized that the student fails to engage in the culture of the laboratory or get to know lab members.

Doctoral students are expected to rotate in three different labs during their first year in residence. Exemption from a third rotation may be allowed if (i) the student has already been accepted into a PI's lab and (ii) it is the determination of the student and the PI that the benefits of starting dissertation research one term early (e.g., spring travel for field work) clearly outweigh the educational benefits of an additional rotation. Exemptions shall consist of a signed agreement (usually in the form of an email) from the advisor and must be approved by the GAC member from the student's home research institute and the director of that institute. The approved agreement must be filed with the Graduate Program Assistant before the end of the student's first year.

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 member(s) 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 in labs of any Institute or Department. Students will rotate in a different lab each term.

Students entering the program typically contact faculty members in a variety of ways, including email up to several months before of the start of fall term, conversations at their Institute retreat (which occurs in mid September), and arranging an in-person meeting

shortly after the retreat. These contacts may lead plans to rotate in the fall term, or in later terms, depending on the student and faculty member's prior rotation commitments. A similar process is used to arrange rotations in subsequent terms.

Students typically choose a dissertation laboratory near the end of spring term and begin their dissertation research at the start of summer term following their first year. If a student has not selected a dissertation lab by the end of spring term, it may be possible for the student to arrange a fourth rotation in summer term, if approved by the student's GAC representative and the Institute Director. In some cases, a newly admitted student may start research during the summer before beginning the program, resulting in an extended fall rotation or, in rare cases, a full summer rotation (interested students should contact faculty member(s) whose labs they are considering to see whether this is a possibility). For students who choose this option, the dissertation laboratory will still be selected 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** (see Evaluation of Progress).

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

1) At the beginning of each rotation, the student and faculty mentor meet to discuss expectations for the rotation. Expectations should be made as explicit as possible, including a description of what would be deemed passing work. 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. Faculty members are reminded that students are typically 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. Students are expected to devote considerable time and attention to the rotation. Success is based on comprehension of the student's research project for that term, effort, and engagement with the lab.

2) During the rotation, the faculty mentor and student should meet on a regular basis. During these meetings, the faculty member provides 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) At the end of their rotation, students interested in doing thesis work in their recent mentors' lab are encouraged to discuss this possibility with them.

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 Institute that admitted the student. 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 GAC rep.

Rotation Presentations

During Final Exam Week of each term, students present their rotation projects in a symposium of short "rotation talks" scheduled by the Department of Biology. Students rotating in labs on the OIMB campus may present at an OIMB hosted symposium. 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 material, and how the project is related to the laboratory's goals.

2) Outcome of the research (findings, problems encountered, etc.).

3) Description of the next steps to be taken if the project were to be continued. There will be up to five minutes of questions and discussion following the presentation.

Students should understand that giving a talk can be somewhat stressful, but also that the ability to present scientific ideas orally is a critical professional skill. These short presentations in a supportive environment provide early training and exposure to the process of scientific speaking. It is important to clearly state the goal of your project, how it fits into the research of the laboratory in which you rotate and/or other research plans you have, and to clearly summarize what you did, how it worked out, and next steps. You are not being evaluated on how important the results were, but on how well you understood your project and can explain it.

TEACHING REQUIREMENT

All candidates for the PhD degree are required by the department to serve three terms as a Graduate Employee (GE) for courses within our program. First-year students normally serve as a GE for one course during each of the three quarters in the academic year. Exceptions are rare and must be approved by the GAC member and director from the student's home research Institute. **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 GE 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 with whom they have served as a Graduate Employee. This information will become part of the student's graduate file and a copy will be given to the student.

Students with the required background and qualifications for teaching the course under consideration will be appointed in the following order:

1) Incoming PhD Biology students

2) Continuing PhD Biology students

3) PhD students from other departments/programs (e.g. Chemistry, ENDS) whose primary advisor is Biology faculty member.

4) Current and incoming Biology Master's students

5) Graduate students from other departments/programs whose primary advisor is not Biology faculty member, but is a member of IE2, IMB, ION, or OIMB.

6) Graduate students from other departments.

This policy, as well as with other policies related to Graduate Employees, can be found at https://gradschool.uoregon.edu/gtf/rights-and-responsibilities/gdrs.

GE PROCEDURES AND INFORMATION

GE Workspace: If a room is needed for office hours, review sessions, or a meeting, contact the Biology Department Administrative Program Assistant.

Computers: A desk equipped with a computer is available in the Biology Office for use by GEs, if needed.

Office Supplies: The Biology Office has supplies and equipment available for instructional purposes. Talk to the Biology Department Administrative Program Assistant in Klamath 77 about supplies needed for your course.

Photocopies and Printouts: GEs are welcome to use the copier in the Biology Office: the required course codes are available from the Biology Department Administrative Program Assistant.

GE Resource Guide: An office manual, with more detailed information about resources and policies, is updated each year. The manual can be found online at GE Resource Guide under the Graduate Studies tab.

GE Absences

Notification

If you are unable to attend work at the scheduled time or to meet a class as scheduled, you must notify your supervisor (the instructor assigned to your course if you are teaching, or the Biology curriculum coordinator if you are the primary instructor of record for a course) as soon as possible. If possible, notify your supervisor in advance of the scheduled work assignment or class that you are unable to attend. If you are able, please attempt to make contact by both phone and email. Do not cancel the class without

permission from your supervisor. To the extent possible, provide information about where you left off (e.g., in the previous class in the case of a teaching GE).

In the case that you are unable to directly notify your supervisor, you may designate someone to make your notification and provide the necessary information to your supervisor using this protocol.

If you are going to miss more than one work week, you or your designee must contact the Graduate School. The Graduate School will coordinate with the GE and the department on any adjustment due to the GE's absence.

Substitution

SUBSTITUTION WITH MORE THAN 24 HOURS NOTICE
Any GE who is assigned to cover the responsibilities of an absent GE with more than 24 hours' notice shall have their FTE adjusted in proportion to the amount of time used for the substitution or have their duties adjusted to account for the substitution.

SUBSTITUTION WITH LESS THAN 24 HOURS NOTICE
Sick leave substitution hours are built into your FTE (see Section 5.0, Workload & Work Assignments). The department will attempt to use substitutes evenly. In some cases, expertise in a subject or availability will determine a substitution. Please track your substituting hours and notify the Biology curriculum coordinator if you believe you will likely exceed the hours allocated in Section 5.0.

Make-up Work

Generally, for duties missed not related to a class meeting, please check in with your supervisor to determine when and how the missed work will be made up.

Planned Absence

If you are planning an approved absence during any working days of the term, be sure your supervisor knows how to reach you (if possible).

Additional Information

More information about GE absences-- including those related to the birth or placement of a child, a serious health condition, or the care of a partner, child, or parent for a serious health condition-- can be found in Article 29 of the UO-GTFF Collective Bargaining Agreement, https://hr.uoregon.edu/employee-labor-relations/employee-groups-cbas.

QUARTERLY EXAMS

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, including development of research proposals. In most cases, students will take the quarterly exams offered by their home Institute.

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**. In CDB, IE^2, IMB, and INGP, students who earn a B- or lower on either of their two quarterly exams, must meet with their institute's GAC representative and institute director to discuss whether they should continue in the graduate program and, if so, under what conditions. In OIMB, students who earn a B- or lower on two of their three quarterly exams must also meet with their institute's GAC representative and institute director.

Quarterly-exams by Institute or Center

CDB

CDB quarterly examination schedule

Fall	Winter[1]	Spring[2]
No exam	IMB exam, or CDB exam if offered[4]	1st year proposal exam[3]

[1]Second Thursday of term if in-person. [2]Date to be announced. [3]Students shall take the proposal exam offered by their home Institute. [4]See home-institute GAC representative for updated exam information.

IE^2

IE^2 quarterly examination schedule

Fall	Winter[1]	Spring[2]
No exam	Knowledge-based: various topics	1st year proposal exam

[1]Second Thursday of term. [2]See below.

The winter QE will be administered as take-home exam to be completed by the deadline specified above. The exam will be graded by the faculty member who wrote the exam and returned to the students within two weeks of the exam deadline. The examiner will then meet with the students, as a group or individually, to discuss the exam. Any student who receives a B- or below will meet individually with the examiner to review the results. A student who earns a C+ or lower on the winter QE will need to make it up by taking the winter term quarterly exam during their second year.

All students planning to carry out dissertation research in an IE^2 lab must take the IE^2 spring quarterly exam, which is administered and graded by an IE^2 faculty member. The basis of the exam is a research proposal on a topic of interest that is unrelated to the student's 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 background 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 and potential outcomes with their implications.

There are two components to this exam:

1. Abstract (**Due April 5**). To ensure that the topic is appropriate, the student must first submit an abstract to the administering faculty member by April 5. This abstract should identify the topic and general approach.
2. Proposal (**Due May 5**). Once the topic is approved by the administering faculty member (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 at the beginning of the first week of spring term.

Students who do not pass this exam will have the opportunity to retake it during the summer term either from the same and different examiner. The student may choose whether to take the exam from the same or a different examiner, but, if a from a different examiner is preferred, the new examiner is to be appointed by the Institute Director. A grade of C+ or lower on the retake will constitute unsatisfactory progress towards the degree.

IMB

IMB quarterly examination schedule

Fall	Winter[1, 2]	Spring
No exam	Various topics	1st year proposal exam

[1]Second Thursday of term if in-person. [2]Students may opt to take the CDB winter qualifying exam if offered.

Preparatory information for the Fall and Winter QE's will be available one week before each exam (students will receive instructions by email). 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 will then meet with the students, as a group or individually, to discuss the exam. Any student who receives a B- or below will meet individually with the examiner to review the results. A student who earns a C+ or lower on the fall or winter QE will need to make it up by taking the fall term quarterly exam during their second year.

The spring term exam will be a take-home exam. Students will be provided with a set of papers on a current topic and the examiner will suggest a hypothesis or alternative models that arise from these papers. Students will develop an outline of a research proposal to distinguish between the models or test the hypothesis. Materials and detailed guidelines will be provided by the end of Winter term. A student who earns a C+ or lower on the spring QE will need to make it up by working with the examiner to either revise their unsatisfactory exam or complete some alternative assignment, which may include writing a new proposal.

INGP

INGP quarterly examination schedule

Curriculum track	Fall	Winter[1]	Spring[2]
Neurons, Circuits & Cognition	No exam	Pre-proposal exam	1st year proposal exam
Theoretical and Computational Neuroscience	No exam	Pre-proposal exam	1st year proposal exam

[1]Due second Thursday of term. [2]Due dates below.

Being able to write compelling grant proposals is requires recognizing important questions and designing sound experiments to answer them. The focus of this exam is to write the Specific Aims page for a proposal that could have ultimately produced the results in a published paper. Preparatory information for the winter quarterly exam will be available one week before the due date (students will receive instructions by email).

The spring term quarterly exam in INGP 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, in preparation an NRSA proposal in the thesis lab.

The subject of the research proposal shall fall within the general focus of the student's research unit (e.g., neuroscience), 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 independent of their rotation advisors. However, they are encouraged to discuss their proposal 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 four components to the exam:

1. Topic statement (**Monday, Week 2**). 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. Proposal review (**Thursday, Week 2**). Read and score one of these examples. Use the review template provided in Appendix 2.
3. Specific Aims page (**Monday, Week 4**). This document must be written in the format of this component of an NRSA proposal (see below).
4. Final submission (**Monday, Week 7**). Submit the Specific Aims page (revised as required by the examiner) and the Research Strategy, written in the format of an NRSA proposal (see below).

Phases (2) and (3) follow the content, page limitations, and formatting guidelines of the National Research Service Awards for Individual Predoctoral Fellows (F31), as spelled out in *Appendix 1: Detailed Instructions for INGP Proposal Examinations*.

The proposal will be scored according to the NIH Scoring System (see Appendix 2). For more information about the NIH Scoring System, consult the following PDF documents and web pages;

https://grants.nih.gov/grants/peer/guidelines_general/scoring_guidance_research.pdf

https://grants.nih.gov/grants/peer/guidelines_general/scoring_system_and_procedure.pdf

https://nexus.od.nih.gov/all/2009/06/01/need-help-interpreting-the-new-review-scores/

The individual categories to be scored are Significance and Approach. A student who earns a C+ or lower on the spring QE (Overall Impact < 5) will need to make it up by working with the examiner to either revise their unsatisfactory exam or complete some alternative assignment, which may include writing a new proposal.

OIMB

OIMB quarterly examination schedule

Fall[1]	**Winter**[2]	**Spring**[3]
Comprehensive	Comprehensive	1st year proposal exam

[1]Week 10. [2]Week 10. [3]See below.

PhD 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, PhD students will write a mock proposal (described below).

During the Interim Advisory Committee meeting, the student will choose two quarters in which to take their knowledge-based quarterly examinations (generally Fall and Winter). 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.

OIMB knowledge-based quarterly examinations:

OIMB faculty members offer the following topics for PhD quarterly exams:

Biochemistry and Molecular Biology (von Dassow), Development (Maslakova), Systematics (Maslakova), Biological Oceanography (Shanks), Microbial Ecology (Shanks), Ecology (Galloway), Biomechanics (Sutherland), Functional Morphology (Young), and Evolution and Genetics (Emlet).

Each PhD student will select four (4) of these topics, in consultation with the members of the IAC. Each of the exam topics will be offered in any term, upon request by the student (with the exception of faculty sabbaticals). At the beginning of each term in which a student will take one of these exams, the student 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 (Week 10) and will be evaluated by one or more marine biology faculty members with expertise in the areas that the respective exams cover.

OIMB quarterly exam (the "mock proposal"):

In addition to the four exams (2 per term), each student will write a "mock proposal" in one of the academic terms of the first year. 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, within the first two weeks of the term. This abstract should identify the topic and general approach. Once the topic has been approved by the administering faculty member, 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 the 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.

Proposals should be written in the format for Graduate Research Fellowship Program applications submitted to the National Science Foundation or similar guidelines, subject to approval of the faculty member in charge of the exam. The faculty member administering the exam is responsible for providing the guidelines to the students. As with the other exams, the proposal will be given a letter grade.

QUARTERLY REVIEW

The progress of each first-year PhD student is monitored and reviewed by the GAC rep from their home research institute. The GAC rep meets with each first-year 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 rep 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 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.

Note: In the event that the student's rotation mentor is the GAC rep for the student's admitting Institute, another faculty member will be assigned by the Institute Director to conduct the quarterly evaluation for the student during that particular term.

SELECTING A THESIS ADVISOR

Before the end of spring term, students should speak with faculty members in whose laboratories they 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 for the student's dissertation research. Students may 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 and receive approval from the GAC rep and institute director. **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.

In rare cases, a student may change advisors. This can happen if the research interests of the student change, or if the relationship between the student and advisor becomes unsatisfactory to either party. If any such change is desired by either the advisor or the student, the advisor or student should initiate discussions with the full Dissertation Advisory Committee (DAC). If any concerns arise prior to the formation of the DAC, the concerned faculty member or student should meet with the student's Interim Advisory Committee (IAC). Such meetings can happen in the absence of either the advisor or the student, if the other party so desires. The DAC (or IAC) should then pass on any recommendations to the Graduate Affairs Committee (GAC), and the GAC must approve any changes to the student's status. Potential outcomes for the student are: remaining in the same lab and continuing on with thesis work; being permitted to attempt to find a new advisor and thesis project; leaving with a Master's degree if the student is unable to find a new advisor; or leaving with a Master's degree without the option of finding a new advisor. A Master's degree must be recommended by the DAC and can be obtained by working with the Graduate Program Assistant to meet the requirements needed to gain approval from the Graduate School.

If a faculty member wishes to have a student leave their lab, for whatever reason, they do not have the authority to make that decision on their own, but must first explain and justify their reasons to the student's DAC who will pass on a recommendation for approval by the GAC.

If a Biology PhD student wishes to pursue thesis research with an advisor in another department, that advisor must first agree to follow the requirements, guidelines, and conventions for attainment of a PhD in the Department of Biology, as specified in The Biology Graduate Student Handbook (current edition). The Graduate Program Assistant will contact advisors outside of the Department of Biology to obtain such agreement prior to the student joining a lab in another department.

Finally, a student can always choose to leave the PhD program if they are so inclined.

A student who joins a lab that is not a member of one of the four institutes (IMB, ION, OIMB, or IE^2) is still a Biology graduate student with all of the associated rights and responsibilities. There will be no difference in course requirements, exam requirements, deadlines, progress tracking, or support from the faculty and staff in Biology. It is possible that the student's research contracts will need to be prepared by their advisor's home department (instead of the admitting Institute office), in coordination with the Biology Graduate Program Assistant, but this is the only difference that the student should experience. If the student's advisor has any questions about the program requirements or procedures, they should contact the Biology Graduate Program Assistant, the Graduate Program Manager, or the Institute's Graduate Affairs representative

FORMATION OF THE DISSERTATION ADVISORY COMMITTEE

Each student has a Dissertation Advisory Committee (DAC), which is responsible for seeing that progress is made toward satisfying all Departmental, Graduate School, and University requirements for the PhD degree. The DAC is also responsible for ensuring that students supported on institutional training programs fulfill the appropriate course requirements.

As soon as a student becomes associated with an advisor (no later than the beginning of the second year of study for the PhD), the student and advisor should discuss the make-up of the DAC. The student must confirm that each potential member of the DAC is willing to serve on their committee and then send the names of all committee members to the Graduate Program Assistant by October 1. DAC membership policies are somewhat complicated, so the student may want to check with the Graduate Program Assistant or Graduate Program Manager to confirm that a faculty member can serve in a particular role before the October 1 deadline.

Detailed committee policies are on the Graduate School website. Students must meet all requirements set by the Graduate School and the Department.

The Graduate Program Assistant must be notified in writing of any changes to the makeup of the DAC.

DAC requirements for INGP, IMB and IE^2 students

1) The DAC consists of five members, one of whom is the student's dissertation advisor. At least four out of the five DAC members must be tenure-track faculty members. A student may request approval for an expert from industry or other company/organization outside academia to serve as a committee member.

2) At least three DAC members must be full or associate members of the student's institute. This requirement may be waived for exceptionally interdisciplinary dissertation projects (i.e. projects at the interface of two or more Institutes). The student and advisor must request the waiver in writing (e.g. by email) to the GAC rep for the student's Institute.

3) At least two members must be in the Biology Department.

4) One 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 Representative. See "Dissertation Committee Policy" on the Graduate School website for the current policy on the Institutional Representative.

5) At least four members must be on the UO campus.

6) Any non-UO faculty member or non-faculty professional must be approved by the department, CAS, and the Graduate School before they can serve on the committee. The Graduate Program Assistant will submit the request.

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. The chair of the DAC cannot be the dissertation advisor. Exceptions to the Institute member requirement must be approved by the GAC rep for the student's Institute. The chair will prepare reports of the annual DAC meetings.

DAC Requirements for OIMB students

The DAC will include five members including at least two members of the OIMB faculty, an Institutional Representative (see "Dissertation Committee Policy" on the Graduate School website for the current policy on the Institutional Rep), and one member of the Biology Department who is not resident at OIMB. That member will serve as the chair of the proposal exam committee and as the chair of the DAC.

Annual DAC Meetings

Students are required to meet with the DAC at least once a year, beginning in year two. DAC meetings should be scheduled during the terms indicated in the table below, at least one week prior to the end of term. DAC meetings are to be scheduled for a minimum of 90 minutes, although 120 minutes is recommended; the full time doesn't have to be used dependent on the desires of the student and the committee. **It is the responsibility of the student to notify the Graduate Program Assistant** as soon as the meeting time is set.

DAC meeting terms by Institute				
	Year 2	**Year 3**	**Year 4**	**Year 5+**
IE2	S[3]	S	W	F
IMB	F[2]	W or S	W or S	W or S
INGP	F[2]	S	S	S
OIMB	W[1]	W	W	W

DAC meetings are to be held before the end of the indicated term. [1]After the qualifying exam and prior to the beginning of Spring term. [2]Prior to this meeting, students must also provide their DAC with an annotated bibliography (a list of 10 key papers from the primary literature (i.e. not reviews), each with a brief summary of the paper's results and significance (i.e. why the paper is included in your bibliography). [3]This DAC meeting should occur no later than the first academic year term following the Proposal Exam. For most students this will be Spring term, following a Winter term exam.

Note: It is the ***student's responsibility*** to schedule DAC meetings and to notify the Graduate Program Assistant of the meeting details (date, time, location) at least one week in advance. Failure to meet with the committee and file a progress report means that the student is not eligible for continued support from any university source in the following academic year.

For IMB and INGP, the purpose of the first DAC meeting in the Fall of the 2nd year is threefold: 1) Give feedback to the student on their current research and their general plans; 2) Evaluate the progress of research and whether the student is progressing at a reasonable pace; 3) Assess and provide feedback on how the student's research plan could be formulated into a successful 2nd year proposal. The final point is meant to ensure the DAC is in agreement as to the direction and approach being taken towards the proposal exam.

Students may have their DAC meeting after the specified deadline if approved to do so in advance by the chair of their DAC and the GAC rep for the student's institute. The GAC rep should email the Graduate Program Assistant to confirm that they approve of the extension and specify a new deadline for the student's DAC meeting.

The following documents must be delivered to each DAC member and the Graduate Program Assistant at least three days before the DAC meeting: (i) progress report and (ii) a new or updated Individual Development Plan (IDP). A template for the progress report and detailed instructions for the IDP can be found online at IDP Instructions. There are two IDP documents – one for 2nd year students and one for students in years 3-5. OIMB students are not required to submit the IDP.

Following the meeting, the DAC chair will submit a report to the Graduate Program Assistant. 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. (In extraordinary circumstances the DAC may recommend continuation without support.)

- Probationary continuation as a graduate student. This recommendation serves as a warning that the student is at risk for termination from the program. Areas of expected improvement must be clearly indicated, a timeline for remedying any deficiencies must be stated, and the means of communicating progress to the DAC (e.g., written report or DAC meeting) should be clearly outlined.

- Termination as a graduate student. This would normally be expected to occur in cases where the student has received a probationary continuation in a previous term, but has failed to adequately address one or more areas of expected improvement by the deadline stipulated by the DAC. Termination, including no further payment of stipend, tuition, and fees, is effective as early as the end of the term in which the student failed to meet the terms of the improvement plan.

The GAC cannot make a recommendation of continuation in the program unless the progress report, IDP, and the report of the DAC chair are on file by the end of the term specified in the table.

DAC recommendations are subject to review by the GAC. A student may appeal the recommendation; appeals are heard by the GAC.

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

APPLICATION FOR TRAINING PROGRAM SUPPORT

Several training programs available to support a subset of PhD students in the Biology Department. An email soliciting applications to these training programs 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 programs is appropriate to apply for, considering the nature of the planned thesis project and whether the advisor is listed as a trainer on the grant.

Students, IAC members, DAC members, and PhD advisors may wish to familiarize themselves with the course requirements of various training programs when planning the student's course work in the early years of their program. Requirements can be fulfilled before or during a student's appointment to the training program.

GTP. Genetics Training Program trainees are required to take: (i) one graded course from each of three areas: Evolutionary genetics, Molecular Genetics, and Developmental Genetics, (ii) one graded course in statistics or quantitative data analysis, and (iii) the non-graded course Bi 610 Ethics in Life Science Research. A list of eligible required courses is provided here.

MBBTP. Molecular Biology and Biophysics Training Program trainees are required to take four graded graduate-level courses. In addition, they are required to take two non-graded courses, Bi610 Ethics in Life Science Research, and Ch/Bi 610 Career Exploration in the Life Sciences. A list of eligible courses is provided here.

DBTP. Development Training Program trainees are required to take a variety of required courses in genetics, statistics, and ethical research conduct. A list of courses is available here.

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 to obtain permission (and a protocol number) from the Office for Protection of Human Subjects or the Office of Veterinary Services and Animal Care, respectively, 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 the student's 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 Welfare Services
https://aws.uoregon.edu/

SECOND-YEAR PROPOSAL EXAMINATION

In the second year, all PhD students will take the Second-Year Proposal Examination. Additional aspects of the Second-Year Proposal Examination that are specific to each research unit are discussed separately below. **It is the *student's responsibility* to schedule their proposal exam and to notify the Graduate Program Assistant of the exam details (date, time, location) at least one week prior to the end of winter term.**

IE^2

Students planning to carry out dissertation research in an IE^2 lab must take the IE^2 proposal exam. The exam will take place during the second half of winter term (Weeks 6-10). It is the ***student's responsibility*** to schedule their proposal exam and to notify the Graduate Program Assistant of the exam details (date, time, location, and makeup of committee) by the end of the first week of winter term. 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 student's DAC. In the event that a 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. The proposal will be developed in consultation with the dissertation advisor and anyone else the student desires to consult (including members of the exam committee, if desired). 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 written proposal must be given to all committee members, and to the Graduate Program Assistant, no later than two weeks prior to the scheduled exam date. This exam will be graded using the pass/revise/fail rubric, as described below.

Grading guidelines

The exam will be graded based on the quality and scope of the written document as well as the student's proficiency in answering general questions about ecology/evolution during the oral portion of the exam. Three outcomes are possible:

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 proposal. 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 rep. This request should be submitted in writing to the IE^2 GAC rep at least three weeks prior to the retake exam. Other members of the exam committee may also be changed, at the GAC rep'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.

IMB

The proposal exams for second-year Biology students in IMB will take place during the second half of winter term (weeks 6-10). It is the ***student's responsibility*** to schedule their proposal exam and to notify the Graduate Program Assistant of the exam details (date, time, location, and makeup of committee) by the end of the first week of winter

term. For this exam students will write and defend a hypothesis-driven proposal on a topic that is the same as or is closely related to their thesis research.

The IMB GAC representatives will assign the exam committee and notify the students at the beginning of the winter term. The exam committee will consist of four tenure-track faculty members, at least two of whom are from the Biology Department. The dissertation advisor may not serve on the committee. Insofar as possible, there will be significant overlap between the exam committee and the student's DAC. In the event that a DAC member is unable to sit on the proposal exam committee, the student, the IMB GAC rep, and the student's advisor will work together to find a suitable replacement.

The purpose of the exam is to assess the student's background knowledge and ability to write and defend a hypothesis-driven research proposal on a topic that is the same as or is closely related to their thesis research. Some thesis projects, especially at the outset, are exploratory and do not involve testing a specific hypothesis. In this case, students should develop and test a compelling and substantive hypothesis that draws on similar background literature and methods as their thesis research. Students may discuss with their thesis advisors whether their thesis project is suitable for the proposal format and, if not, may get feedback from their thesis advisor on alternative hypotheses to use for this purpose.

Communication about the exam with your advisor. The exam is meant to encourage interactions between you and advisor, not restrict them. Accordingly, you are encouraged to discuss anything about your project, including questions, hypotheses, approaches, and literature relevant to your thesis research, by writing and/or discussion with your advisor. You can work with your advisor to write the specific aims page of your proposal text and on your oral presentation, but you should prepare the rest of the text and slides for the oral presentation independently.

Format of Written Proposal and Oral Presentation

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 must include:

- a title page that includes the time, date, and location of your exam, and the names of all committee members (and the chair).

- an introduction that clearly states the specific biological problem the proposal is addressing. A broad ("big picture") problem should be introduced (broad questions are too big to be addressed by a single thesis project), along with the more focused question the proposed research is designed to address (the focused question will be answered by your thesis project). 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.

The written proposal must be sent to all committee members, and to the Graduate Program Assistant, at least one week prior to the scheduled exam date.

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 oral presentation and defense is closed to the public, and the thesis advisor is not permitted to attend.

Grading guidelines

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

Background knowledge. Does the student have in-depth knowledge of the papers provided in their annotated bibliography? 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.

The scoring sheet to be used by the Exam Committee can be found in Appendix 3.

INGP

The proposal exams for second-year Biology students in INGP will take place during **spring term**. It is the student's responsibility to schedule their proposal exam and to notify the Graduate Program Assistant of the exam details (date, time, location, and makeup of committee) by **Week 10 of Winter term**. Students 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 INGP Proposal Examinations*.

The examination will proceed according to the following schedule.

1) One week prior to defense date: Submission of the Specific Aims and Research Plan (email documents to INGP GAC Rep, all members of the student's DAC, and the Graduate Program Assistant).

2) The exam can be scheduled anytime during Spring term, with the Friday of Week 10 of the term being the last date possible for oral defense.

The exam committee will be composed of the student's DAC, minus the thesis advisor. In the event that a DAC member is unable to sit on the proposal exam committee, the student, the ION GAC rep, and the student's advisor will work together to find a suitable replacement or allow the exam to proceed with three members.

Proposal document. 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. Accordingly, the written proposal should be developed in consultation with the thesis advisor and anyone else the student wishes to consult, including members of the student's DAC. Students are encouraged to submit proposal drafts to their advisor as part of the process of formulating a coherent and practical research plan. Advisors should limit their feedback to general suggestions for improvement; insertion of text and re-writing are not permitted.

Oral examination. Students should prepare a 30-minute slide presentation that includes the same key elements as the written proposal. The examination begins with this presentation. Faculty members are encouraged to ask questions at any time during the presentation. However, it is the job of the Chair to ensure the candidate has enough time to complete their presentation. The examination is limited to 2 hours. The presentation is closed to the public, and the thesis advisor is not permitted to attend.

Grading criteria

The proposal and oral defense will be evaluated with the following criteria (also see exam report form below):

Background knowledge. Does the student have in depth knowledge of the relevant background papers necessary to understand the research question posed? Is the student knowledgeable about and fluent in describing 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 model(s), 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. The scoring sheet to be used by the Exam Committee can be found in Appendix 4.

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 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.

Grading guidelines

The exam will be graded based on the quality and scope of the written document as well as the student's proficiency in answering general questions during the oral portion of the exam. Three outcomes are possible:

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 proposal. 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 rep. This request should be submitted in writing to the OIMB GAC rep at least three weeks prior to the retake exam. Other members of the exam committee may also be changed, at the GAC rep'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.

Retaking the Proposal Exam (all institutes)

Second-year proposal examinations may be retaken, but only once. If a student does not pass the retake, the student's DAC will 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.

ADVANCEMENT TO CANDIDACY

Advancement to candidacy is a formal step that indicates that all requirements for the PhD 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) All quarterly exams have been passed.

2) Three rotations have been completed with satisfactory evaluations.

3) The proposal exam has been passed.

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

5) Courses required by institutes, training programs, and advisory committees (IAC and DAC) have been taken – or a plan for their completion has been approved by the DAC.

6) 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/N.

7) 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. In ION, IE^2, and OIMB, the DAC will recommend advancement if this meeting is positive and the criteria above have been met. Because 2nd-year IMB DAC meetings occur in the fall, the GAC rep will consult with each IMB student's advisor and DAC chair in the spring to confirm their approval of advancement at that time.

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

Note: It is only after advancement to candidacy that a student may take dissertation credits (BI 603) – see 1C in the Summary of Departmental Regulations for Graduate Students on page 32.

EVALUATION OF PROGRESS

Regarding incomplete grades: at any one time, a student may 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.

First Year

Quarterly evaluation of first year students is completed by the GAC rep from their home institute.

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

1) Satisfactory quarterly reports by the GAC rep.

2) Three lab rotations have been completed with satisfactory evaluations.

3) Satisfactory teaching evaluations.

4) GPA $\geq$ 3.0 in graded coursework and no grades of N or I.

5) Grades of B- or better on all quarterly exams, with no more than one B- in CDB, IE^2, IMB and ION and no more than two B- in OIMB.

6) Identification of a thesis advisor by the end of the summer of year one.

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

Second Year and Beyond

In the second and subsequent years, the GAC and the Graduate Program Assistant review progress toward the PhD, 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 two and beyond include:

- GPA $\geq$ 3.0
- Grades of Pass or higher on all examinations and pass-fail courses
- Satisfactory rates of data acquisition, analysis, and/or dissemination
- No unexplained absences
- Prompt responses to emails from the student's advisor and DAC
- Regular attendance at lab meetings
- Regular attendance at departmental seminars and journal clubs
- Giving at least 1 journal club presentation each year
- Meeting with DAC by deadline (unless extension has been approved)

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.

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.). Students wishing 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, 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.

Over the course of their PhD, students must receive a passing grade for at least 18 credits of BI 603 Dissertation. Six of these credits must accrue in the final two terms of the student's tenure. 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 *strongly* recommended that you meet with the Graduate Program Assistant, as soon as you have decided on a term for graduation, to make sure that everything is in order.**

Prior to scheduling, review the "Oral Defense Procedures" on the Graduate School website.

The complete dissertation must be submitted to all members of the DAC at least 1 week before the date of the final oral examination. All of the following conditions must be satisfied before the dissertation is considered complete:

1) All sections of every chapter are complete; there are no place holders or other indications of text, figures, or tables to come.
2) All in-text references are correctly formatted references and the complete bibliography is included.
3) Each figure and table are accompanied by a legend.
4) The document has been spell checked.
5) In-text pointers to figures (e.g., Fig. 1), tables (e.g., Table 1), and references (e.g., Watson and Crick, 1953) refer to the correct figure, table, or reference.
6) The thesis advisor has signed-off on the document indicating that conditions 1-5 have been satisfied.

Exceptions to submission of a completed thesis require approval of the DAC.

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 one-hour 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 total time allotted for the defense varies by institute:

IMB – 1.5 hours

INGP – 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 the defense before the scheduled start time (the student may request additional set up time). Rooms are reserved through the Department of Biology Administrative Program Assistant. For the best selection of rooms, contact the Administrative Program Assistant as soon as a date and time is selected.

RESOLUTION OF CONFLICTS

There are a number of avenues within the University through which students who experience difficulties can pursue the resolution of conflicts.

Advisor and Departmental Contacts
The first point of contact for graduate students who are having conflicts with other students, instructors, or administrators is their advisor. For first year students who don't yet have a permanent advisor, that person is their rotation advisor. If the conflict is with the advisor or if the student is uncomfortable reporting to their advisor, they can report the conflict to the GAC rep, the Institute Director, the Graduate Program Manager, or the Department Head.

University Contacts and Formal Processes
Students should typically pursue informal resolutions to conflicts within the Institute or the Department (as described above) whenever possible. If after attempting informal resolution the conflict is not resolved, then there are more formal avenues that students can pursue. These include the University Ombuds Program, the GTFF Grievance Process, and The Office of Investigations and Civil Rights Compliance.

The University of Oregon Ombuds Program provides confidential, impartial, independent, and informal conflict management assistance to the University of Oregon community at no charge. The Ombuds Program works with individuals and groups. In addition, the Ombuds Program provides customizable workshops for campus conferences, team meetings, department retreats, or other university events. Finally, the Ombuds Program provides non-identifying feedback to university leadership on trends and concerns in the community.

Employees covered by a collective bargaining agreement have a right to a union representative in certain scenarios. Employees have a right to a union representative during investigatory interviews or questioning when the employee has a reasonable belief that discipline or other adverse employment consequences may result from what he or she says. This does not apply to normal supervisor/employee interactions where discipline is not contemplated, even when the feedback is critical.

The Office of Investigations and Civil Rights Compliance (OICRC) offers the UO community a place to discuss and report issues, concerns, and conflicts regarding discrimination and harassment, including sex or gender-based harassment, stalking, bullying, or violence in accordance with university policy and federal and state laws.

SUMMARY OF DEPARTMENTAL REGULATIONS FOR GRADUATE STUDENTS

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 do not register for summer term.** If instructed to register for summer, students should

check with their advisor and the Graduate Program Assistant BEFORE registering.

b) After advancement to candidacy, all students must register for a minimum of 9 and a maximum of 16 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 programs or the DAC. Registration for any additional courses will require approval of the advisor.

c) Students working toward a PhD must complete a minimum of 18 hours of *Dissertation - Bi603* before their degree can be awarded. They may register for these hours after advancement to candidacy, but MUST be registered for a minimum of 3 credits of *Dissertation - Bi603* 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 the degree is awarded. A student is enrolled as either a student in residence or a student on leave of absence (no fees charged). A leave of absence must be approved by the department and the Graduate School.

b) A student failing to maintain continuous enrollment 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 five years provided the student is making "satisfactory progress" toward the PhD degree. Progress is assessed by the GAC on an annual basis.

b) The guarantee of financial support is limited to PhD 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. The GAC 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.

To summarize these requirements, students need:

1) A total of 45 graduate level credits, 24 of which must be graded and taken while in residence at the UO. Graded credits do not have to be Biology credits.

2) At least 30 hours must be in graduate-level Biology courses.

3) Nine credits must be *Thesis - BI 503*. These are usually taken during year two. The student must register for at least one *Thesis - BI 503* credit during their last term.

4) At least 9 credits must be 600-level.

5) Maintain a 3.00 GPA.

For a Master of Science, there is no language requirement.

You may be required to obtain a protocol number prior to conducting research.

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. 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 submitting documents to the Graduate School must be met in the final (spring) quarter.

Spring Term 2
Grad seminar. Research.

Thesis preparation, defense, graduation.

Writing a Thesis Proposal – Spring year 1

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 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.

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.

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 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.

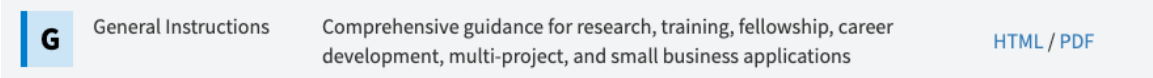
The thesis committee must approve the thesis proposal and the thesis. Each member of the committee is expected to actively participate in the project execution and evaluation and should voice their opinions throughout thesis work.

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 official paperwork.

APPENDIX 1: Detailed Instructions for INGP Proposal Examinations

These instructions pertain to: (i) INGP Spring Quarterly Examinations and (ii) INGP Second Year Proposal Examinations.

Familiarize yourself with the NIH's requirements for Research Training Plans in NRSA awards. Go to https://grants.nih.gov/grants/how-to-apply-application-guide.html, click on



Go to section G.430. Carefully read the Research Plan Section, parts (3) Specific Aims and (4) Research Strategy.

Your written proposal shall comprise three or four sections: (1) Specific Aims (1 page), (2) Research Strategy (6 pages), (3) References Cited, and (4) Advisor's role (second-year only).

Your proposal MUST conform to the following format.

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 have on the research field(s) involved. Most proposal exams have 2, rarely 3, distinct objectives (Specific Aims). Enumerate the Aims and provide a short paragraph describing the specific activities you will perform, their rationale, and relationship to the overall goal of the research. There is no need to include citations in this section.

2. Research Strategy (6 pages)

Provide the following content, organized under the HEADINGS and *subheadings* given below. Use all 6 pages. Use figures and tables as needed to illustrate key concepts, preliminary results, research design, and expected results. Each figure should be accompanied by a detailed legend.

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.

Transformative approach. Explain briefly in general terms how you propose to overcome these hurdles. Describe the strengths and weaknesses in the rigor of the prior research (both published and unpublished) that serves as the key support for the proposed approach.

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

APPROACH

The overall Approach section should be divided into separate sections for each specific aim. Two aims is usually about the right scope for an NRSA, but having three aims is acceptable, In many cases, aims themselves may be divided into subaims. For each aim or subaim, include the following subsections:

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

Preliminary studies. Include published or unpublished information on preliminary studies that demonstrate the feasibility of the approach. Site the sources of this information. First-year proposals will rely on published data only.

Approach. Describe the experiment you will perform. Include an overview of the materials, procedures (including statistics), methods, and manipulations that will be involved in the experiment. This section will be less detailed than the methods section of a paper.

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.

3. References Cited (not included in page limits)

4. Advisor's role (1 paragraph)

Include a statement written by the Advisor describing his/her role in formulating the Specific Aims and Research Strategy (Second year exams only; not included in page limits).

Mandatory Formatting Instructions

Real applications that fail to follow NIH formatting instructions exactly are not reviewed. Accordingly, proposal exams the fail to follow formatting instructions exactly will not be graded until revised.

Font

Use the Arial 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: Fully justify the document (left and right justification turned on). Activate automatic hyphenation to save space.

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, except 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 and tables only.

Submission

First-year students. On or before the examination due date, submit the Specific Aims, Research Strategy, and References Cited as a single Word document.

Second year students. One week prior to the date of the examination, submit the Specific Aims, Research Strategy, and References Cited as a single Word document.

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.

Study and emulate examples of successful proposals, the more the better:

https://www.niaid.nih.gov/grants-contracts/sample-applications

Common pitfalls to avoid:

1. Serial dependency. A serial dependency occurs when, for example, Aim 2 cannot be accomplished unless a particular result is obtained in Aim 1. Design your aims so that they are immune to this problem.
2. Fishing expedition. When the reviewer judges that the work is merely the obtaining of facts without clear hypotheses to be tested, the comment is often made by the reviewer that this is a "fishing expedition."
3. Other common pitfalls.

Useful reference material:

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

General advice on grant writing:

https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/write-your-application.htm

Anatomy of a Specific Aims page:

https://www.biosciencewriters.com/NIH-Grant-Applications-The-Anatomy-of-a-Specific-Aims-Page.aspx

The Elements of Style, by W. Strunk and E. B. White. *The* classic text on expository prose.

A Sense of Style, by S. Pinker. A modern follow-up to *The Elements of Style*.

Fowler's Modern English Usage, by H. W. Fowler. If you don't know when to use *which* versus *that*, or what a dangling participle is, then you need this book.

APPENDIX 2: INGP Spring Quarterly Grading Form

Principal Investigator:

Exam grade:

Add bullets as necessary in each strength and weakness section, limiting text to ¼ of a page per section. The criterion headings are hyper-linked to the standard NIH review criteria. If you cannot access the hyperlinked criterion titles, please see http://grants.nih.gov/grants/peer/critiques/rpg.htm. In addition, key review points for this RFA are added to each criterion. For detailed information on this FOA, please visit **http://grants.nih.gov/grants/guide/rfa-files/RFA-NS-14-009.html**

Overall Impact/priority

Overall Impact: After considering all of the review criteria, briefly summarize **in a paragraph** the significant strengths and weaknesses of the application and state the likelihood of the project to exert a sustained, powerful influence on the field. An application does not need to be strong in all categories to be judged likely to have major scientific impact. Score: 000

INDIVIDUALLY Scored Review Criteria

1. Significance: Does the project address an important problem or a critical barrier to progress in the field? If the aims of the project are achieved, how will scientific knowledge, technical capability, and/or clinical practice be improved? How will successful completion of the aims change the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field? Score: 000
Strengths • **Weaknesses** •

2. Approach: Approach. Are the overall strategy, methodology, and analyses well-reasoned and appropriate to accomplish the specific aims of the project? Are potential problems, alternative strategies, and benchmarks for success presented? If the project is in the early stages of development, will the strategy establish feasibility and will particularly risky aspects be managed? Score: 000
Strengths • **Weaknesses** •

Impact	Score	Descriptor	Additional Guidance on Strengths/Weaknesses
High	1	Exceptional	Exceptionally strong with essentially no weaknesses
	2	Outstanding	Extremely strong with negligible weaknesses
	3	Excellent	Very strong with only some minor weaknesses
Medium	4	Very Good	Strong but with numerous minor weaknesses
	5	Good	Strong but with at least one moderate weakness
	6	Satisfactory	Some strengths but also some moderate weaknesses
Low	7	Fair	Some strengths but with at least one major weakness
	8	Marginal	A few strengths and a few major weaknesses
	9	Poor	Very few strengths and numerous major weaknesses

APPENDIX 3: IMB Qualifying Exam Report Form

The Exam Committee Chair will report on the exam using the template below. This report will be distributed to the student, the home department, the thesis advisor, and the IMB Graduate Affairs Committee.

Student_____ Chair_____Other committee members_____ _____Exam date_____Start and end time_____

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

Exceptional Satisfactory Needs Improvement Unsatisfactory

2. Statement of significance (logic, clarity, etc.)

Exceptional Satisfactory Needs Improvement Unsatisfactory

3. Statement of hypothesis (logic, clarity, justification, etc.) -- The exam requires defining one or more **hypotheses**, which should be the most reasonable answer(s) to the proposal's specific question based on what is already known. Hypotheses must be justified by prior observations.

Exceptional Satisfactory Needs Improvement Unsatisfactory

4. Experimental approach – The exam requires development of an **experimental approach** that rigorously tests the hypothesis.

Exceptional Satisfactory Needs Improvement Unsatisfactory

5. Knowledge of relevant background material – The student should have a command of **background knowledge** relevant to their proposal, broadly defined.

Exceptional Satisfactory Needs Improvement Unsatisfactory

6. Professional demeanor during the defense -- The student should be able to field questions calmly without being defensive or evasive.

Exceptional Satisfactory Needs Improvement Unsatisfactory

Provide comments addressing any issues for items 1-6 above, or other items that warrant mentioning (e.g. quality of writing, etc.).

Any aspect of the exam deemed "unsatisfactory" or "needs improvement" 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.

APPENDIX 4: Grading Form for the Second-Year Proposal Exam (IMB, INGP)

For students taking the IMB and INGP second-year 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, and the thesis advisor.

Examination Report: Second-year proposal examination

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

Unsatisfactory Satisfactory Exceptional

2. Statement of significance (logic, clarity, etc.)

Unsatisfactory Satisfactory Exceptional

3. Statement of hypothesis (logic, clarity, justification, etc.) -- 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. Hypotheses must be justified by prior observations.

Unsatisfactory Satisfactory Exceptional

4. Experimental approach -- The exam requires development of an **experimental approach** that rigorously tests the hypothesis.

Unsatisfactory Satisfactory Exceptional

5. Knowledge of relevant background material -- The student should have a command of **background knowledge** relevant to their proposal, broadly defined.

Unsatisfactory Satisfactory Exceptional

6. Professional demeanor -- The student should be able to field questions calmly without being defensive or evasive.

Unsatisfactory Satisfactory Exceptional

Provide comments addressing any issues for items 1-6 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.

APPENDIX 5A: Courses required by the Genetics Training Program

I. DISTRIBUTION REQUIREMENT: One graded course to be taken from each of the following groups.
Developmental Genetics:
Developmental Genetics - Bi528
Developmental Neurobiology - Bi566
Neurogenetics - Bi510
Bacterial-Host Interactions - Bi533

Molecular Genetics:
Molecular Genetics - Bi620
Advanced Molecular Genetics - Bi524
Molecular Basis of Human Disease - Bi527

Evolutionary Genetics:
Molecular Evolution - Bi584
Population Genetics - Bi586
Molecular Phylogenetics - Bi587
Evolutionary Processes - Bi588

Students may also satisfy this requirement by taking any three of the six 1-credit BI610 modules offered by IE^2 faculty (Kern, Ralph, Singh, Phillips, Streisfeld, Barber).

II. TRAINING IN THE RESPONSIBLE CONDUCT OF RESEARCH *Ethics Life Science Research - Bi610*. This course is taken in the second year of study.

III. TRAINING IN STATISTICS *Foundational Statistics – Bi610, Advanced Biological Statistics - Bi610*

IV: Optional but recommended: *Introduction to Biological Computation - Ch610* (Ken Prehoda) (focus on Python) or *MatLab for Biologists - Bi510* (Cris Niell).

APPENDIX 1 5B: Courses required by the Molecular Biology and Biophysics Training Program

1. Core Curriculum Course (Winter term): *Advanced Biochemistry - Ch662*

2. One graduate course in quantitative biophysics/biochemistry*:
   Physical Biochemistry - Ch565
   Introduction to Biophysics - Phys610
   Structural Biochemistry - Ch566
   Cellular Biochemistry - Ch568

3. One graduate course in computational methods*:
   Computational Chemistry - Ch547
   Introduction to Programming for Molecular Biologists - Ch510

4. One graduate course in biological statistics*:
Advanced Biological Statistics - Bi610
Foundational statistics - Bi610

*Other courses may be substituted subject to approval of petitions by the MBBTP Executive Committee.

4. *Ethics in Life Science Research - Bi610*
†This course should be taken in the fall of the second year, and again in the fall of the sixth year if student has not graduated by then.

6. *Career Exploration in the Life Sciences - Ch/Bi610*
This course should be taken in the 3rd or 4th year and is taken in lieu of the Journal Club for that term.

Note: You should NOT register for research credits or other courses over the summer, unless there is a particular course that is relevant to your training that is offered only during the summer and you have approval from Teri Mellor.

APPENDIX 5C: Courses required by the Developmental Biology Training Program

1. *Molecular Genetics - Bi620*. Fall term, usually in the first year.

2. *Developmental Genetics - Bi528*. Usually spring term, first or second year.

3. One of the following three courses, as recommended by the trainee's Dissertation Advisory Committee (DAC) and approved by the Executive Committee. Students can petition for alternative coursework better aligned with their thesis research. Usually, winter or spring of the second year.

Stem Cells: Disease and Regenerative Medicine - Bi510
Developmental Neurobiology - Bi566
Genomic Approaches & Analysis - Bi593

4. *Advanced Biological Statistics - Bi610*. Usually, fall of the second year.
or *Foundational Statistics - Bi610*. Usually, spring of the first or second year.

5. *Ethics in Life Science Research - Bi610*. Fall of the second year.

6. Computational Training. Optional. We strongly encourage trainees to train in biological computation by taking one of three courses: *Intro to Programming for Biologists - Bi510, Computational Bioinformatics - Ch610, Matlab for Biologists - Bi510.*

Further information about required courses is available here.