Graduate Student Handbook

Department of Biology, University of Vermont (February 2023)

About This Handbook

This handbook is designed to give you the most important information that you need and to answer the questions that are most frequently asked by graduate students in Biology. We try to keep it up to date, but University and Departmental policies evolve and change, so please let us know if any of the information needs revision.

Contents

Department and University Structure

What is the administrative structure of graduate studies?

You are enrolled as both a member of the department of Biology, which is within the College of Arts and Sciences and the UVM Graduate College. The Graduate College makes university wide requirements and standards for graduate student, the department makes more specific requirements that must adhere to the university standards.

Departmental Committees (2023)

Chair of Department	Bryan Ballif
Chair of Graduate Program	Nicholas Gotelli
Faculty on Graduate Affairs Committee	Melissa Pespeni & Laura May-Collado
Graduate Students on Graduate Affairs Committee	Thomas O'Leary & Maia Austin
Graduate Student Senate Representatives	Alison Hall & Dan Muntenau

Who should I contact about what?

Primary points of contact: In most cases your *major advisor* will be your primary resource for information and advice. On occasion, they may direct you to other members of the department for guidance. You should also look to your *Co-Representatives to Graduate Affairs Committee* listed as another invaluable resource for information and direction. They are happy to answer any of your questions and/or point you in the right direction.

Biology Office: There are many administrative questions (*e.g.* mail, courses, building, and equipment) that may arise over the course of your graduate studies, and the first step towards getting answers is to contact the Biology Office:

Department of Biology
University of Vermont
120 Marsh Life Science Building
109 Carrigan Drive
Burlington, Vermont 05405 USA

Phone: (802) 656-2922
Email: Biology@uvm.edu

Conflict Resolution: Even in a smoothly-functioning lab, there will be occasional disagreements, disputes or conflicts that can arise. As a department, it is important that any disagreements, large or small, be discussed and promptly resolved. You should never feel that you are isolated and do not have anyone you can go to about a problem. Depending on the details of the issue, you can contact your major advisor, the Department Chair, the head of the Graduate Affairs Committee, one of your other committee members, Counseling Services, or the Graduate College for advice and guidance. If they are not able to help you directly, they can put you in touch with the right person. Resolving disputes promptly, in a professional and equitable way, is a high priority for the department. Another useful resource is the UVM Graduate Student Ombudsperson.

What degree programs are offered by Biology?

The Biology Department offers three advanced degrees: The Doctor of Philosophy (PhD), the Master of Science (MS), and the Accelerated Master of Science Program (AMP). Students may enter the PhD program with either an undergraduate science degree or an undergraduate science degree and an MS degree. The AMP program is designed for UVM Biology major undergraduates, who apply to the program in their junior year, so that the course work in their senior year counts towards some of the credits for the MS degree. The PhD, AMP, and MS degrees all require course work, a candidacy exam, a written thesis, and a public thesis defense presentation.

Getting Started with Graduate Studies

How do I obtain keys and get set up when I first arrive at UVM?

First check with your major advisor to find out where your office will be located, and what laboratory rooms you will need access to for your research. You should contact the Biology Main Office at biology@uvm.edu or 802-656-2922 to set up an appointment to fill out necessary paperwork for obtaining your keys to the building, your office, and laboratory space, as well as any employment paperwork (GTAs/GRAs). You will also receive directions on how to set up your NetID, email, and obtain a student ID (CatCard).

If you need to obtain a campus parking permit, the details are here (https://www.uvm.edu/transportation/student-parking).

How do I find out the details about my salary, benefits, and health insurance coverage?

First, review your contract letter, which contains important details about your salary and benefits as a graduate student. As a UVM employee, your benefit and salary details are managed by the PeopleSoft software package. With your student ID, you can log into your PeopleSoft account here (https://erp.w3.uvm.edu/), which will allow you to set up automatic deposit with your bank and will give the dates and amounts of your most recent and past paychecks, as well as information on fees and any outstanding balances.

A note on receiving your first paycheck to assist you in budgeting and planning: You will not receive your first paycheck until after the first pay period of the semester (typically September 15th).

Your health care coverage is through the UVM health care system, and the facilities are described here (https://www.uvm.edu/health/insurance). Once you have your student ID, you can receive an assignment for a personal health care physician. Most routine health care appointments take place at the student health care center at 1 South Prospect Street (https://www.uvmhealth.org/medcenter/location/1-south-prospect-street), which is directly adjacent to the main campus. Surgery and more extensive care facilities are located at the UVM Medical Center- Main Campus (111 Colchester Avenue), which is also a short walk from campus (https://www.uvmhealth.org/medcenter/location/uvm-medical-center-main-campus).

How do I set up my graduate committee?

You should begin by talking with your major advisor to start getting a focus on your specific research interests. Your advisor should be able to suggest a few potential faculty members,

both within the Biology Department, but also in other units on campus. You should contact these faculty members, introduce yourself, and set up a meeting to talk with them about your research interests. It probably will not be until near the end of your second semester that you will actually select your committee. Official committee members must be members of the UVM Graduate College (https://www.uvm.edu/graduate/graduate_faculty).

For PhD students, your committee will consist of your advisor, two faculty members within the Biology Department, and one faculty member from another department. For MS and AMP students, your committee will consist of your advisor, one faculty member within the Biology Department, and one faculty member from another department.

A note on External Committee Members: You may elect, in consultation with your advisor, to invite additional committee members from outside the University of Vermont to advise you formally as part of your graduate studies committee. It is important to note however, that for the purposes of the Defense Committee, these external committee members do not count towards the required minimum faculty mentioned above – each of those must be a member of the University of Vermont Graduate Faculty. You can find additional information on Selecting a Defense Committee at the following link. (https://www.uvm.edu/sites/default/files/defensemembershipform.pdf).

How often should I be meeting with my committee and my advisor?

At a minimum, you should have a formal committee meeting at least once a year. These meetings typically last 1 to 1.5 hours. They are an important chance to discuss your research progress, data collection, plans for the upcoming year, roadblocks or unexpected challenges, course work, and other issues.

You will want to ask your advisor to set up a schedule for regular meetings about your research. Many students meet weekly with their advisors, others do so on a less frequent schedule. But regular contact is important to stay in touch as your work progresses. You may also want to consult with other committee members individually about specialized topics (such as experimental design, or laboratory protocols) that are part of your work.

Are there additional things I need to be aware of as an international student?

International students are at UVM with F-1 or J-1 visas and to maintain their student status must follow immigration rules. Before planning fieldtrips or personal trips outside the US first consult with the Office of International Education (OIE) before your departure. Here areas some things to keep in mind to maintain your student status you must:

- enroll as a full-time student
- inform OIE of changes to your address within 10 days of change
- update OIE if there are any change in major, degree, or program of study

- maintain a valid passport
- have a travel signature on your I-20 or DS-2019 from OIE within the past 12 months
- keep your visa updated

For more information go to https://www.uvm.edu/oie/immigration.

Course Requirements

What are the course and unit requirements for a graduate student?

Briefly, for the PhD in Biology, 75 credits are required, including a minimum of 30 graded course credits (A-F scale), 20 research credits (S/U) and 25 additional course or research credits. Four credits of graded colloquia (special topics seminars of 1-2 credits, excluding Biology Seminar, Graduate Seminar, Proposal Writing, and Ethics & Survival Skills) are required. These 4 credits will count towards the 30 required graded credits. Also counting towards the graded credit requirement are the following required courses: Ethics & Survival Skills (2 credits), Computational Biology (4 credits), Proposal Writing (2 credits), Graduate Seminar (1 credit for each of the first 5 semesters), Biology Seminar (1 credit for each of the first 4 semesters). The remaining 9 graded credits will come from content-based graduate courses (typically three 3-unit graduate courses from across campus and/or additional graded graduate colloquia). Of these 30, up to six credits of 2000-4000-level undergraduate coursework are allowed if recommended by the advisor to address deficiencies in the incoming student's background. Before enrolling in these courses, approval from the Graduate College is required.

For the AMP/MS in Biology, you must complete 15 graded course credits, 6 research credits, and 9 additional course or research credits for a total of 30 credits. For the AMP, up to 9 graded graduate-level course credits (5000-level or higher) may be completed as part of your bachelor's degree in your final year to count towards your AMP. As part of the 15 graded course credits, AMP/MS requires: Ethics & Survival Skills (2 credits), Computational Biology (4 credits), Proposal Writing (2 credits), Graduate Seminar (1 credit taken in the next-to-the last semester), and 1 credit of a content-based graduate colloquium. The remaining 5 course credits can be taken as graded elective courses. Of these 15, up to three credits of 2000-4000-level undergraduate coursework are allowed if recommended by the advisor to address deficiencies in the incoming student's background. Before enrolling in these courses, approval from the Graduate College is required. However, for the AMP student, these three credits must be taken after their senior year.

Other details, especially about transfer credits, can be found on the Graduate College site – typically Master's students are allowed 9 transfer credits and PhD students are allowed up to 24 transfer credits (https://www.uvm.edu/sites/default/files/transfercredit2.pdf).

How do I decide which other courses to take?

Talk first to your major advisor and the other students in your lab, your committee will also make recommendations. Your advanced course work should train you in specific skills, such as

computer modeling, statistical analysis, bioinformatics, microscopy and imaging, and molecular/lab techniques.

What are the weekly department and graduate seminars?

The Biology Department Seminar (which meets at noon on Mondays) and the Graduate Seminar (which meets at noon on Fridays) are opportunities to hear about new research. Equally important, they provide an opportunity to establish your mentoring and friendship networks within the department. As such all faculty and all graduate students are expected to attend these two seminars every week.

The Biology Department Seminar presents invited speakers from within and outside the UVM campus to speak on their research. The department seminar committee solicits suggestions for invited speakers, so this is a good chance for your lab to host a visitor and do some networking. If you would like to invite a speaker for seminar, please contact the instructor of seminar listed on the schedule of courses and they will assist you with the process. If you have any questions please contact your Graduate Student Co-Representatives, and they will help point you in the right direction.

The Graduate Seminar highlights presentations by department graduate students describing their research plans and progress. Each graduate student is required to make at least one presentation a year in Graduate Seminar. First-year graduate students may be presenting their research plans or perhaps results from previous undergraduate or MS research. More advanced students will present results of ongoing experiments and studies that are part of their thesis research or possibly other collaborative projects. Senior graduate students may use Graduate Seminar to practice a full-length job seminar or a shorter conference presentation. Often, Graduate Seminar consists of two shorter graduate student talks back-to-back.

What are the grade, residency, and unit requirements for a graduate student to be in good standing?

Until they reach the 75 (PhD) or 30 (MS/AMP) credit requirement, students typically register for 9 credits per semester (fall & spring) and 5 credits in the summer. Some of these credits will be graded courses and some will be research credits. More details can be found here (https://catalogue.uvm.edu/graduate/admissionfinancial/fellowshipsassistantships/). You must hold a GPA of 3.00 or higher to be in good standing and to graduate. The Graduate College policy is a maximum of 5 years to complete an MS and 9 years to complete a PhD. In Biology, students usually complete the AMP/MS in 1 to 3 years, and the PhD in 5 to 6 years.

What does a typical course schedule look like for a PhD student?

Here is a typical schedule for a PhD student. For the Year 1 and Year 2 schedules, we have inserted the specific required classes.

Required graded course credits: 30 credits

Required research credits: PhD: 20 credits

After completing a total of 75 credits, you will enroll in GRAD 903. This is important because it reduces fees by about 50%, which will save you hundreds of dollars a semester. In a PhD, enrollment in GRAD 903 typically begins after about 3 and a half years.

Semester	Course	Category	Credits	Total
Fall 1	BIOL 381 Graduate Seminar	Required Seminar (graded)	1	9
	BIOL 385 Biology Department Seminar	Required Seminar (graded)	1	
	Elective 1	Course (graded)	3	
	BIOL 491	Research	2	
	BIOL 371 Survival Skills & Ethics	Required Colloquium (graded)	2	
Spring 1	BIOL 381 Graduate Seminar	Required Seminar (graded)	1	9
	BIOL 385 Biology Department Seminar	Required Seminar (graded)	1	
	BIOL 381 Computational Biology	Required Course (graded)	4	
	Elective 2	Course (graded)	3	
Summer 1	BIOL 491	Research	5	5
Fall 2	BIOL 381 Graduate Seminar	Required Seminar (graded)	1	9
	BIOL 385 Biology Department Seminar	Required Seminar (graded)	1	
	Elective 3	Course (graded)	3	
	BIOL 491	Research	2	
	Foundations	Required Colloquium (graded)	2	
Spring 2	BIOL 381 Graduate Seminar	Required Seminar (graded)	1	9

	BIOL 385 Biology Department Seminar	Required Seminar (graded)	1	
	Colloquia	Colloquia (graded)	2	
	Proposal Writing	Required Course (graded)	2	
	BIOL 491	Research	3	
	Proposal Defense & Oral Exam	Deadlines: 30 April & 31 May	Pass/Fail	NA
Summer 2	BIOL 491	Research	5	5
Fall 3	BIOL 381 Graduate Seminar	Required Seminar (graded)	1	9
	BIOL 491	Research	8	
Spring 3	BIOL 491	Research	9	9
Summer 3	BIOL 491	Research	5	5
Fall 4	BIOL 491	Research	6	9
	GRAD 903	Continuous Graduate Registration	3	
Spring 4 and beyond	(GRAD 903)	(Continuous Graduate Registration)	(9)	(9+)

Total Credits (minimum 75)	**78(+)**
BIOL 381 Graduate Seminar (required graded seminar)	5
BIOL 385 Biology Department Seminar (required graded seminar)	4
BIOL 371 Survival Skills & Ethics (required graded course)	2
BIOL 381 Computational Biology (required graded course)	4
Foundations (required graded colloquium)	2
Proposal Writing (required graded course)	2
Other Colloquia (required graded course)	2
Elective Courses (required graded courses; typically three 3-credit courses)	9
Courses (Total)	30
BIOL 491 Research (Total)	45
GRAD 903 Continuous Graduate Registration (Total)	3(+)

What does a typical course schedule look like for an MS/AMP student?

Here is a typical schedule for an MS/AMP student.

Required graded course credits: 15 credits
Required research credits: MS/AMP: 6 credits
After completing a total of 30 credits, you will enroll in GRAD 903. This is important because it reduces fees by about 50%, which will save you hundreds of dollars a semester. In an MS/AMP, enrollment in GRAD 903 would begin after 2 years.

For AMP students, the fall and spring semester of year one correspond to the final year of undergraduate enrollment. Undergraduate degree requirements will dictate what other courses need to be taken in the first year to also complete the undergraduate degree.

Semester	Course	Category	Credits	Total
Fall 1	Elective 1	Course (graded)	3	9
	Colloquium	Required Colloquium (graded)	1	
	BIOL 371 Survival Skills & Ethics	Required Colloquium (graded)	2	
	BIOL 491	Research	3	
Spring 1	BIOL 381 Computational Biology	Required Course (graded)	4	9
	Proposal Writing	Required Course (graded)	2	
	BIOL 491	Research	3	
	Proposal Defense & Oral Exam	Deadlines: 30 April & 31 May	Pass/Fail	NA
Summer 1	BIOL 491	Research	5	5
Fall 2	Elective 2	Course (graded)	3	9
	BIOL 381 Graduate Seminar	Required Seminar (graded)	1	
	BIOL 491	Research	4	
	GRAD 903	Research	1	
Spring 2	GRAD 903	Continuous Graduate Registration	9	9

Summer 2	GRAD 903	Continuous Graduate Registration	5	5
Fall 3 and Beyond	(GRAD 903)	(Continuous Graduate Registration)	(9)	(9+)
			Total Credits (minimum 30)	**46(+)**
			BIOL 381 Graduate Seminar (required graded seminar)	1
			BIOL 371 Survival Skills & Ethics (required graded course)	2
			BIOL 381 Computational Biology (required graded course)	4
			Proposal Writing (required graded course)	2
			Other Colloquia (required graded course)	1
			Elective Courses (required graded courses; typically two 3-credit courses)	6
			Courses (Total)	16
			BIOL 491 Research (Total)	15
			GRAD 903 Continuous Graduate Registration (Total)	15(+)

What elective courses can be used?

A variety of courses from many departments are available for fulfilling your elective requirements. You should work with your advisor and your committee to select courses that are tailored to your research and background. For some possibilities, here is a list of courses and colloquia that have been suggested by our PhD and MS students:

- Techniques in Microscopy (NSCI 328; course)
- Introduction to Pharmacology (PHRM 201; course)
- Responsible Conduct in Biomedical Research (NSCI 327; colloquia)
- Ethics in graduate research (PBIO 295; colloquia)
- Cell Biology (CLBI 301; course)
- Developmental Molecular Genetics (BIOL 265; course)
- Neurodevelopment (BIOL 266; course)
- Sensory Systems and Hormones (BIOL 371; course)
- Statistical Methods I (STAT 211; course)
- Biochemistry (BIOC 301; course)
- Neurobiology (BIOL 261; course)
- Methods in Bioinformatics (MMG 232; course)
- Proteomics (BIOL 371; colloquia)
- Cell signaling and development (BIOL 372; colloquia)
- Graduate Writing (BIOL 371; colloquia)
- Therapies for Neuro-disorders (BIOL 371; colloquia)

- Data Science (CS 287; course)
- Ecological Genomics (BIO 381; course)
- Applied Multivariate Analysis (STAT 223; course)
- Bioinformatics (MMG 232; course)
- Phylogenetic Systematics (BIO 381; course)
- Advanced Genetics (BIO 204/205; course)
- Molecular Cloning (MMG 201; course)
- Modeling Complex Systems (CS 302; course)
- Evolutionary Computation (CS 352; course)
- Fundamentals of GIS (NR 343; course)
- Applied Geostatistics (STAT 369; course)
- Data Modeling for Environmental Science (PBIO 394; course)
- Quantitative Thinking in the Life Sciences (PSS 381; course)
- Advanced Quantitative Thinking in the Life Sciences (NR 395; course)
- Data Science II (STATS 387; course)

Other lists of elective courses can be found through other similar graduate programs:

- https://www.uvm.edu/cmb/course-requirements
- https://www.uvm.edu/neurosciencegrad/program_study

Research

What common equipment is available to graduate students in the Marsh Life Science Building?

There are **printers** available on the first and third floor. Common **conference rooms** (MLS 124 & 226) can be booked through the Biology Office. The **Biology Stockroom** is located in the basement of Marsh Life Science. They have stocked some common laboratory supplies, and there are forms for special ordering available at https://www.uvm.edu/cas/biology/lab-and-life-sciences-stockroom. You may contact biostock@uvm.edu for more information.

Major Equipment and Facilities

The Department of Biology has shared molecular biology equipment a gel imaging and documentation system, chemical fume hoods, stereomicroscope, compound microscope, confocal microscope, sorvall centrifuges, an ice machine, liquid nitrogen, and other miscellaneous equipment for molecular biology. Individual labs also often share access to their lab equipment with proper communication and training including: NanoDrop, Qubit, qPCR, PCR, water baths, tissuelyser, cell culture hoods, among other miscellaneous equipment. Additional resources and facilities are available at various core facilities at the University of Vermont (http://www.med.uvm.edu/research/corefacilites). The Vermont Integrative Genomics Resource core offers a range of services related to sequence data generation and analysis including a bioanalyzer, Sanger and Illumina sequencing, and bioinformatics support (http://www.med.uvm.edu/vigr/home). Additional relevant core facilities include the Proteomics Facility, the Microscopy Imaging Center, the Flow Cytometry and Cell Sorting Facility, the Instrumentation and Model Facility (for custom design and fabrication of various mechanical and electronic equipment and instruments), and the Biostatistics Research Core, among other resources. These resources are available for training or a service-for-a-fee.

Vermont Advance Computing Core (VACC): The VACC has three high-performance computing clusters and associated data management and storage services. The VACC is maintained by UVM and has the capacity to perform massively parallel computations for a wide range of applications. VACC's mission includes strategic support in three key areas: advancing high-impact, multidisciplinary research efforts; promoting advanced computing education and outreach across disciplines; and investing in next-generation, innovative and sustainable high performance computing infrastructure models. Daily operations of the VACC are managed by staff who maintain both its hardware and software facilities, and who provide expert assistance for those wanting to use these facilities to achieve orders of magnitude increases in computational speed.

What sources are available for graduate student research and travel funds?

There are some limited competitive funds for graduate student travel (the UVM Biology Chair's Award, the John Wheeler Award, and the Ronald Suiter travel award (https://www.uvm.edu/cas/travel_funding_ronald_suiter_prize)) and research (The Roberto Fabri Fialho Research Award (https://www.uvm.edu/graduate/student_awards)). Most students fund their research through a combination of small grants that they apply for from scientific societies, and resources available from their advisor's grants. Students are also highly encouraged to apply for predoctoral grants though national funding agencies like the National Science Foundation and National Institutes of Health. Talk to your advisor about research-specific grants.

Do I need to take any lab safety training courses?

All graduate students are strongly encouraged, and most times required, to take the lab safety training modules and annual updates offered by Risk Management (https://www.uvm.edu/riskmanagement/training). These courses and others may be required for students who are doing research on federally-funded grants. There are also basic safety and maintenance protocols within each lab and within the teaching labs, including yearly refreshers and updates. Talk to your advisor and other graduate students in the lab about the details.

Teaching

What courses will I be TAing and how do I learn how to teach?

At the start of the academic year, the Graduate College hosts some orientation workshops that you are required to attend. They cover general topics such as Day One – Engaging Your Students in the Classroom, UVM Reporter Training, Identifying and Supporting Students of Concern , FERPA Basics, Understanding Your GTA Funding Package, a GTA Panel, and Responding to Culture and Social Justice in the Classroom. More specific training for teaching the Biology labs occurs in the department itself. There are a number of other teaching resources and workshops available on campus if you are interested (https://www.uvm.edu/ctl/contact/).

In your first year of teaching, you may be a TA for one of the labs in the first-year Biology Courses (Bio 11/12 or Bio 21). These labs are fairly simple and reliable, and you will learn how to teach these sections in weekly lab meetings with the course coordinator. With a little teaching experience under your belt, you may then move into one of the more specialized second-year courses, such as BCOR 102 (Ecology and Evolution), BCOR 101 (Genetics) or BCOR 103 (Cell Biology). These labs are a little more sophisticated, and again there will be weekly meetings where you will learn the details. Finally, we have a number of advanced specialty courses (e.g. Computational Biology, Physiology, Neurobiology) in which the TA duties are quite specialized. Some of these labs require more time for setting up, but they also have smaller class sizes. TAs for these labs are chosen because of their particular expertise. We will always be careful to make sure you are not being asked to teach something that is outside of your expertise. We also try to let you teach the same course in multiple years, so that you can benefit from your past experience. Each semester, the department asks the graduate students which classes they would prefer to teach; we also ask the faculty which graduate students they would prefer as TAs for their classes. We do our best to match up both sets of requests.

What are my responsibilities as a Teaching Assistant?

If you are a GTA, your contract states 20 hours a week devoted towards your duties as a teaching assistant. At a minimum, your responsibilities are to prepare for your lab teaching each week, to show up and teach the lab for the full scheduled time, to post and be available for regular office hours to your students, to promptly complete the grading of lab exercises and return graded assignments to students, to attend weekly lab and organizational meetings, and to maintain safety procedures and follow protocols during your teaching. In addition, depending on the course you are teaching, there may be additional requirements of prepping and setting up labs, attending lectures (especially if you have never taught the course before), and assisting with the proctoring and grading of midterm and final exams. All of these important GTA duties are for the undergraduate student benefit and your own professional

development; this should not be taken lightly. As a graduate student in the classroom, you have the satisfaction of knowing that you are making a difference in their undergraduate careers!

Proposal & Thesis Defense

What is the purpose of the proposal defense?

The purpose of the proposal defense is to test a student's comprehension of the field, allied areas of study, capacity to undertake independent research, and ability to think and express ideas clearly.

A PhD or MS graduate student is someone enrolled in a graduate program. Usually students spend the first 1-2 years focusing on classes and then focus on research. A student becomes a PhD or MS candidate after completing all (or most of) their course work and successfully passing their proposal defense. The format and name of this exam varies across disciplines, but in the Biology Department, we call it the proposal defense and it has a written and an oral part.

Both parts are taken following a schedule of specific deadlines in the second year. These deadlines ensure that all students promptly complete the exams and are treated equitably. The strict timeline also ensures that the written and oral exams are completed over a short period of time so that they do not drag out and interfere with ongoing research and teaching.

What is the timeline of the proposal defense?

For PhD students entering in the fall semester, the exam is taken in the spring semester of the second year in the program. For example, if a student entered the PhD program in the fall semester of 2023, the exam would be taken in the spring semester of 2025 which corresponds to the 4th semester (excluding summers) of enrollment.

For MS students entering in the fall semester, the exam is taken in the spring semester of the first year in the program. For example, if a student entered the MS program in the fall semester of 2023, the exam would be taken in the spring semester of 2024 which corresponds to the 2nd semester of enrollment.

For AMP students entering in the fall semester, the exam is taken in the fall semester of the second year in the program (= your first graduate-only year). For example, if an AMP student entered the program as an undergraduate senior in the fall semester of 2023, the exam would be taken in the fall semester of 2024 which corresponds to the 3rd semester of enrollment in the AMP.

The deadline for submission of the written proposal to the advisor and all committee members is 5:00 pm on 30 April.

The oral component of the exam must then be scheduled between 1 May and 31 May. To give the committee enough time to review the proposal and prepare questions, there must be at least one week (and preferably 2) between the submission of the proposal and the oral exam. Both the submission of the proposal and the scheduling of the oral exam should be established well in advance, because graduate students and faculty are not always available during and after finals week.

For AMP students, and students who enter the program in the spring semester, these deadlines will be shifted to proposal submission by 5:00 pm of 30 November, with the oral exam occurring between 1 December and 31 December.

Unless there are specific circumstances that have been explicitly pre-approved by the advisor and the department chair at least 30 days before any deadline, this schedule applies to all graduate students.

What is the structure of the written proposal?

For the written part, the student prepares an NSF/NIH R01-style research proposal (with literature references) that describes the rationale, background literature, experimental or sampling design, statistical analysis, and biological interpretations of the proposed research. The length is between 8 and 10 single-spaced pages of narrative (including figures and tables), plus additional pages as needed for the literature cited, with a minimum of 25 citations from papers in peer-reviewed journals. For a PhD, this length is comparable to a typical grant proposal. For the MS and AMP, the required length is 5 to 7 pages, plus 15 or more citations. The proposal may include figures and preliminary data as part of the narrative. Examples of proposal from previous students are available from your major advisor and will be provided during the Proposal Writing course.

The student should initially consult with the major advisor for general feedback on the organization and content of the first draft of the proposal, and the student is expected to develop the proposal in the Proposal Writing course. Students must write the text proposals entirely by themselves. However, they may receive feedback from their peers and use the facilities of the graduate writing center for copyediting.

What is the structure of the oral defense?

For the oral exam in May, the student should meet well in advance with the advisor, and also talk with individual committee members. Committee members will sketch out the kinds of materials they want the student to prepare for, and they will provide a set of readings for the student. Oral exams usually last 1.5-2 hours. You should schedule 2 hours for your exam. Before starting the oral exam, the committee should have decided the written proposal is adequate for advancing to candidacy. This does not mean that there will not be changes requested before passing.

The format for the oral exam is:

I. The student will provide the written research proposal to the examination committee at least one week prior to the oral defense.

II. At the beginning of the oral defense the committee meets briefly (no more than ten minutes) without the student present in order for committee members unfamiliar with the process to be informed of the process and for the committee to comment to each other on their impressions of the written part of the exam.

III. The student returns will use the whiteboard/chalkboard (no .ppt or other electronic presentation) to describe the aims of the research proposal, including the necessary background/justification/goals/hypotheses for the research. This will take 10-15 minutes. The examination committee/all in attendance should not interrupt.

IV. The examination committee, as organized by the chair, will take turns asking questions about the written research proposal. This will typically take about 45 minutes and will focus mostly on a defense of the research proposal justification/background, and exploring alternative approaches and delving into methods, anticipated results, data analysis etc. Questions during this period would be similar to issues raised in an external grant review.

V. Break for 5 minutes as desired/is necessary for the committee and student.

VI. The examination committee, as organized by the chair, will ask questions regarding the student's general foundational understanding of the discipline and subdisciplines of their field of study (this should cover all aspects of coursework). It is understood that some amount of the questions from this part, as well as part IV will bleed into each other. This will take about 45 minutes.

VII. The student is then asked to leave the room and the committee deliberates about whether or not the student has passed the written exam and if they have passed the oral exam. A student can pass both the written and oral parts of the exam, only one part, or neither part.

VIII. The student returns to the room and the chair summarizes the results, which may take the following forms:

A. Pass with no need for further work on the comprehensive exam.

B. Contingent Pass with an explicit and detailed written list of requirements for passing in full. This is often revisions to your written proposal and/or additional reading to address gaps identified during the oral exam.

C. Fail. You will discuss with your committee and major advisor your options.

Note that the written and oral are two different "exams", and thus a student can have two different outcomes for them (eg, pass the written but fail the oral). One retake of the written and/or oral exam is allowed if a student fails either portion. Contingent passes and failures must be corrected by the end of the next semester. Specific deadlines and timelines must be established in writing by the committee and sent by the committee chair to the Graduate Program Director and the Department Chair.

IX. The chair of the committee informs the Graduate College AND Aaron Robinson/the administrative support specialist in charge of graduate affairs of the outcome by email (copying the committee and the student).

The same format is followed for MS, AMP and PhD students; however, the length and depth of questions vary depending on the degree. Unless there are specific circumstances that have been explicitly pre-approved by the advisor and the department chair at least 30 days before any deadline, this exam format applies to all graduate students.

What is the structure of the dissertation or thesis?

Although many details of the organization of the dissertation will be worked out with you and your advisor, there are a number of requirements for specific formatting of the dissertation, which are specified by the graduate college (https://www.uvm.edu/graduate/resources).

Many examples of successful theses and dissertations are available in the department office and online https://library.uvm.edu/collections/theses?search_type=dept&dept=67. You will notice they vary a bit in formation and length. They typically begin with an acknowledgements section and an overall abstract that describes the contents of the individual chapters and places them in context. Other requirements, such as a comprehensive literature review, are up to the advisor's discretion. You should begin discussing the content and organization of your chapters with your advisor and your committee well before you begin writing. You are encouraged to write and organize your chapters as stand-alone manuscripts prepared for submission to a peer-reviewed journal. Successful students often have one or two of their dissertation chapters already submitted or even published before the defense. There is no particular requirement for a certain number of chapters or page lengths. The faculty are more concerned that the quality and quantity of research are appropriate for the advanced degree and represent substantive new contributions to the scientific literature.

What is the structure of the final defense?

Once the committee agrees that the student is ready for their final defense, the student must contact the graduate college with this information and initiate the associated forms. The defense is advertised and formally announced by the department and the graduate college. It is scheduled as a full 50-minute seminar. Sometimes this can be scheduled during the standard departmental seminar or Graduate Seminar time slots, but more often it occurs during a separate scheduled time. At least two weeks before the defense, the final copy of the dissertation should be sent to all committee members so that they have time to read it and make editorial suggestions.

The defense is open to the public (family and friends often attend in person or virtually), and should be a seminar that reflects the organization, content, and details of the research that are appropriate for an audience of biologists. After the presentation, there is a standard question period in which anyone in the audience can ask questions of the speaker. The audience and the speaker then leave, and the committee discusses the oral presentation and the dissertation or thesis and any particular questions they might have for the closed part of the exam.

The student then returns and the committee discusses the details of the thesis or dissertation and any comments on the writing. Often, the committee will ask for additional changes that the student needs to make before the dissertation is submitted. Typically, the major advisor oversees the editorial changes to the final version. Often, these changes are relatively minor, and the committee may choose to sign the official paperwork in advance of these final editorial changes. Although the committee member from outside the department is issued the paperwork, it is traditional for the advisor to make sure the documents are properly signed (either in person or electronically). It is usually the student's responsibility to submit the final paperwork and copy of the dissertation before the deadlines that are specified by the graduate college.

Graduate Student Life

Does UVM provide any housing options for graduate students?

Yes, there are some options for graduate student housing that can be explored here (https://www.uvm.edu/reslife/affiliate_housing). The housing market is tight in Burlington, and it can be difficult to find housing close to campus that isn't too expensive and/or located in a noisy neighborhood. UVM has some resources for locating off-campus housing here (https://www.uvm.edu/oscr/resources/off_campus_housing_resources). You should definitely ask other graduate students about possibilities that they may be aware of; sometimes good leases and rentals are available from students who are finishing up and leaving the Burlington area. Once you've set up your UVM affiliated email, another good source for graduate student life and housing is through the Gradnet listserv. Details on how to sign up for it can be found here: https://www.uvm.edu/graduate/gradnet.

What kind of counseling, health and wellness resources are available to graduate students?

If you are experiencing any personal health or wellness concerns, the University of Vermont has excellent, confidential, counseling resources available at no cost. You can find the help you need through great counseling resources and wellness programs: https://www.uvm.edu/health

What if I am having a dispute or problem in my lab or in my teaching duties?

The first person to approach for lab problems is your major advisor, and the first person to approach for teaching duty problems is the instructor or lab coordinator for the course you are teaching. Depending on the nature of the issue, you may also want to talk with the Biology Department Chair of Graduate Studies, the graduate student representative to the Biology Department Graduate Studies Committee, the Biology Department Chair, the counseling resources on campus or faculty and staff in the Graduate College. Your conversations at all of these levels can be frank, and they will remain confidential unless you say otherwise. We encourage frank and prompt discussion of potential problems so that they can be resolved quickly to everyone's satisfaction.

Are there any social activities organized by the Biology Department?

Yes! The department has a social committee run by fellow graduate students that organizes events such as parties, lunches, picnics, photography and pumpkin-carving contests, and other activities throughout the year. Some of these events are for graduate students only, and others are for the entire department. There are regular e-mail announcements of upcoming activities, and we are always looking for new suggestions for social events for the department. Please contact the Social Committee (uvmbiopartyplanning@gmail.com) if you'd like to join or have suggestions for events!

Are there other ways to engage and lead within Department and Graduate College?

The Department has Graduate Student Co-Representatives to the Graduate Affairs Committee. These Co-Reps represent the thoughts and ideas of the graduate student body to the faculty within the department, as well as assist with graduate student recruitment and interviews. If you are interested in serving the department in this capacity please reach out to your current Co-Reps to talk more about this opportunity. Typically, the co-representative structure allows each rep to serve a two year term overlapping for one year with another co-representative. This allows you to learn the process in the first year, and then lead a new co-rep the following year.

At the level of the Graduate College, there is Graduate Student Senate (GSS) (https://www.uvm.edu/gss). GSS is an organization under the UVM Graduate College that aims to represent and communicate the needs of graduate students to UVM administration, faculty, staff, and undergraduate organizations. GSS also has historically hosted events free of charge to the graduate student community.

There are numerous ways to be involved:

- You can attend GSS meetings which are open to the UVM graduate student community: https://www.uvm.edu/gss/calendar-events
- Participate as a voting senator representing the Biology department
    - Allows you to be part of committees which vary by year and involve different topics of interest such as stipends and benefits, housing concerns for graduate students, event planning, and more!
- Serve on the executive board and be in closer communication with UVM administration including but not limited to UVM Board meetings, regular meetings with the Dean of the Grad College, and organizing the myriad projects senators bring to GSS that to improve grad student life at UVM

What are the department's expectations on behavior and participation?

Being a graduate student involves much more responsibility than taking classes, conducting research, and writing your thesis or dissertation. As a department, we have expectations for student behavior throughout your time here at UVM:

- **Treatment of others –** All members of the department (students, undergraduates, staff, and faculty) expect courtesy, professionalism, respect, kindness, and fairness in all of our in-person and electronic interactions. The Department of Biology and the University of Vermont are committed to a safe, affirmative climate with several policies in place https://www.uvm.edu/aaeo/policies-and-procedures
- **Diversity, Equity, and Inclusion –** The department is currently drafting its own DEI statement. For now, we refer you to the University of Vermont's DEI statement (https://www.uvm.edu/about_uvm/diversity), which we enthusiastically support. This site contains details and links to other resources.
- **Academic honesty –** Science is only possible in an atmosphere of transparency and truthfulness. For course work, this means adherence to the university policies that do not tolerate cheating, collusion, or plagiarism (https://catalogue.uvm.edu/undergraduate/academicinfo/rightsandresponsibilities/). For research, this means adherence to the principle that data should be fully available and that all results should be repeatable and verifiable. Fabrication, falsification, or alteration of data, analyses, or graphics may be grounds for dismissal (https://www.uvm.edu/ovpr/research-integrity}.
- **Teaching obligations –** Most graduate students are supported by graduate teaching assistantships, and successful instruction in our laboratory courses is a critical component of the department's teaching mission. In your teaching, you are obligated to attend weekly wet-lab meetings, prepare for and deliver your weekly lab presentations, actively engage with students during your lab sections, grade and return all assignments promptly and carefully, and hold posted office hours to help students with their work. But you will also need to actively engage with your teaching material, improvise solutions when needed, help other TAs, and do whatever it takes to make sure the laboratory portion of the course runs smoothly and that you deliver quality instruction. You must fulfill all of your obligations so that you pull your weight and do not become a burden to the course instructor or the other graduate students.
- **Engagement in the department –** The department has relatively few students and faculty members, so active engagement is important to your success and ours. You are expected to be actively present in the department, engaging with other graduate students and faculty members in discussing research and teaching. Although travel is sometimes an important part of our research, we expect people to be living nearby and regularly present in the department. The department does organize a number of social events. Although these are not required, attendance and participation are always encouraged.
- **Seminar attendance –** Although there are always a number of interesting seminars and lectures each week on campus, the Department of Biology hosts two weekly seminars that all graduate students and faculty and expected to attend and participate in. The weekly department seminar is given by outside speakers, both from UVM, and from other institutions. Your lab may be hosting an invited seminar speaker, and meeting individually with speakers from other departments and universities is an excellent way to extend your network of scientific connections. Active participation in the weekly department seminar is especially important because of the small size of our department (and therefore our audience for invited speakers). The second weekly

seminar event in the Biology Department is the Graduate Seminar. The speakers in this seminar are almost always graduate students in the department. Each student is expected to give at least one presentation per year in Graduate Seminar. Depending on the stage of your research, this may not necessarily be a full 50 minute seminar. We will sometime have faculty presentations or outside speakers in Graduate Seminar for career development, teaching instruction, and coverage of other topics of interest to graduate students. Active attendance and engagement is required for both the weekly departmental seminar and the weekly Graduate Seminar.

- **Conflict resolution –** Even in a smoothly-functioning lab, there will be occasional disagreements, disputes or conflicts that can arise. As a department, it is important that any disagreements, large or small, be discussed and promptly resolved. You should never feel that you are isolated and do not have anyone you can go to about a problem. Depending on the details of the issue, you can contact your major advisor, the department chair, the head of the graduate affairs committee, one of your other committee members, counseling services or the graduate college for advice and guidance. If they are not able to help you directly, they can put you in touch with the right person. Resolving disputes promptly, in a professional and equitable way, is a high priority for the department.
- If you have a situation that makes engaging in the department or seminar attendance difficult for a few weeks or more contact someone in the department or counseling services that you feel comfortable communicating with so that we can be aware. We do not need to know the specific details, just that there is an issue.

Time Table of Important Tasks

Here is a list of the target completion dates for different components of your thesis (PhD, MS or AMP). Most students begin in the fall semester, so these completion dates refer to the end of the spring semester of each academic year you are enrolled in the program.

Doctor of Philosophy (PhD) Program

- Each year
    - Make a research presentation to the department in Graduate Seminar
    - Attend weekly departmental seminars
    - Be an active, engaged member of your lab group and of the department
    - Update your Individual Development Plan (IDP) with your advisor
    - Update your Graduate Student Information System (GSIS) account
- End of year 1
    - Assemble graduate committee
- End of year 2
    - Complete written proposal (by April 30) and proposal oral defense (by May 31)
    - Complete departmental required courses (*i.e.*, Computational Biology and Scientific Survival Skills)
- End of year 3
    - Complete required 30 credits of course work
- End of year 4
    - Complete bulk of field or laboratory data collection
    - Submit at least one manuscript for publication to a peer-reviewed journal in your discipline
    - In year 4 or year 5 – if you have been supported by grant funding rather than a TAship, complete at least one approved teaching activity (usually TAing for a course)
- End of year 5
    - Complete written dissertation
    - Defend thesis in a public seminar
    - Submit paperwork and final copy of approved thesis to graduate college

Master of Science (MS/AMP) Program

- Each year
    - Make a research presentation to the department in Graduate Seminar
    - Attend weekly departmental seminars
    - Be an active, engaged member of your lab group and of the department
    - Update your Individual Development Plan (IDP) with your advisor
    - Update your Graduate Student Information System (GSIS) account
- End of year 1
    - Assemble graduate committee by end of first semester
    - Complete proposal writing course
    - Complete proposal (by 30 April) and proposal defense (by 31 May)
- Beginning of year 2
    - Complete departmental required courses (*i.e.*, Computational Biology and Scientific Survival Skills)
- End of year 2
    - Complete written thesis
    - Defend thesis in a public seminar
    - Submit paperwork and final copy of approved thesis to graduate college