Department of
BIOLOGICAL SCIENCES
Clemson University

Graduate Student Guide
2025-2026

Welcome to the Graduate Programs in the Department of Biological Sciences

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Department of
BIOLOGICAL SCIENCES
Clemson® University

This guide is designed to provide information for graduate students in the Department of Biological Sciences, with specific requirements for those students in the following on-campus programs:

Biological Sciences, M.S.

Biological Sciences, Ph.D.

Environmental Toxicology, M.S.

Environmental Toxicology, Ph.D.

Microbiology, M.S.

Microbiology, Ph.D.

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WELCOME AND INTRODUCTION

The Faculty, Staff, and Students of the Department of Biological Sciences would like to welcome you into your graduate program. There are many exciting and challenging disciplines within our department. As a graduate of the Biological Sciences, Environmental Toxicology, or Microbiology programs you will be a qualified professional, capable of addressing and seeking solutions to many of the critical problems facing society, both nationally and globally. We are pleased that you have chosen one of our programs for your graduate experience, and we look forward to helping you reach your full potential.

These guidelines are provided to assist you in accomplishing your academic and career objectives and to help you comply with the expectations for students pursuing a graduate degree in our department. Thus, these guidelines constitute a program supplement to the Clemson University Graduate School Policies and Procedures Handbook. It is important to note that these guidelines do not replace the Graduate School's policies and procedures. It is your responsibility to familiarize yourself with the Graduate School's policies and procedures handbook and comply with all policies, procedures, and regulations pertaining to graduate study. The Graduate School's Policy Handbook sets a minimum standard for the University. Because these minimum standards may be exceeded by requirements of the Biological Sciences, Environmental Toxicology, or Microbiology Program, there may be cases where the policies contained in these guidelines differ from those written in the Graduate Policy Handbook.

These guidelines provide a statement of the graduate program expectations, resources, and procedures. Therefore, you must familiarize yourself with these guidelines and the program policies and expectations. The Program Coordinator and your Faculty Advisor are available to assist you in interpreting these Guidelines.

I. ORGANIZATIONAL STRUCTURE RELEVANT TO GRADUATE STUDENTS

A student's primary interface with the University on a day-to-day basis is the Faculty Advisor and other faculty, particularly those comprising the Advisory Committee. Other Administrative entities exist, and their roles and responsibilities are briefly summarized here.

Faculty Advisor: Chosen by mutual interest, consent and agreement between the student and that faculty member and approved by the Program Coordinator (see below). The Faculty Advisor guides the student in the selection of courses, directs the student's research, serves as an advocate in all academic matters, and often provides financial support for the student in the form of a research assistantship.

Thesis/Dissertation Committee: The Thesis/Dissertation Advisory Committee is chaired by the Faculty Advisor. Other committee members are selected by the student in consultation with their Faculty Advisor and are approved by the Graduate Program Coordinator.

Lead Graduate Programs Coordinator: The Lead Graduate Programs Coordinator chairs the Graduate Advisory Committee (GAC – see below), oversees the Graduate Programs in Biological Sciences, Environmental Toxicology, and Microbiology, and coordinates assessment of the graduate programs. The Lead Graduate Programs Coordinator, together with the GAC, administers compliance with these Graduate Student Guidelines and revisions as deemed appropriate by the Program Faculty. **Lead Graduate Programs Coordinator: Chris Parkinson**

Graduate Program Coordinator (GPC) for Biological Sciences: The Biological Sciences Program Coordinator supports graduate admissions and current graduate students in the on-campus Biological Sciences M.S. and Ph.D. degree programs. **Biological Sciences GPC: Chris Parkinson**

Graduate Program Coordinator (GPC) for Environmental Toxicology: The Environmental Toxicology Program Coordinator supports graduate admissions and current graduate students in the on-campus Environmental Toxicology M.S. and Ph.D. degree programs. **Environmental Toxicology GPC: Bill Baldwin**

Graduate Program Coordinator (GPC) for Microbiology: The Microbiology Program Coordinator supports graduate admissions and current graduate students in the on-campus Microbiology M.S. and Ph.D. degree programs. **Microbiology GPC: Zhicheng Dou**

Graduate Advisory Committee (GAC): Evaluates applications and makes recommendations for student admissions, interprets Program policies and guidelines, approves course substitutions and waivers in special cases, and recommends changes in the Guidelines to the faculty. **GAC Members: Chris Parkinson, Jason Fridley and Kara Powder (BioSci), Bill Baldwin and Lisa Bain (ENTOX), Zhicheng Dou, Emily Rosowski and Vince Richards (Micro).**

Graduate Student Services Coordinator (GSSC): The GSSC supports all the on-campus graduate programs from prospect through graduation, including hiring graduate students, serving as the first point of contact for all student questions, assisting with tracking student milestones, and submitting all required forms. **GSSC: Candice Blassingame**

Dean for the College of Science: Administers teaching activities and faculty responsibilities in the College, allocates College scholarships and fellowships, and approves all graduate student Committee Selections and Plans of Study. **Dean: Dr. Cynthia Y. Young**

Dean of the Graduate School: Administers and approves all official graduate student work, formulates policy and standards, unifies administrative procedures relevant to graduate study to include admissions policies, graduate programs, university-wide scholarships, and fellowships and granting of degrees. **Dean: Dr. John Lopes**

II. M.S. PROGRAM INFORMATION

Graduate school policies and procedures

The final authority resides with the Graduate School. Their policies and procedures can be found here: Graduate School Policy Handbook.

A. M.S. Program Rules, Requirements, and Policies

Below are degree requirements for students who enter the Department of Biological Sciences for one of the following three M.S. programs: Biological Sciences, Environmental Toxicology, or Microbiology.

The Master of Science (M.S.) degree is conferred to those who have demonstrated mastery of general biology and of advanced biology in an area of concentration. The major emphasis of the master's programs in Biological Sciences, Environmental Toxicology, and Microbiology is to provide an environment for the student to learn how to think critically, pose questions and answer them by experimentation, perform library research, write, and communicate in scientific formats, and develop into a mature, articulate, and competent scientist.

It is the graduate student's responsibility to stay in touch with their Faculty Advisor and graduate advisory committee and ensure all requirements are fulfilled. The GPCs, Faculty Advisor, and GSSC will check in periodically with each student to see how they are progressing in their program. If they do not make progress towards their degree, there will be a discussion as to how the student can improve. If the student still does not make progress towards their degree, they may be dismissed from the program.

The student is ultimately responsible for complying with the regulations of the Department of Biological Sciences and Clemson University Graduate School, and they should be aware of all procedures, deadlines, etc. as they may not be reminded by faculty. Graduate School policies and procedures can be found in the Graduate School Policy Handbook.

The Master's Program involves the following procedures:

- Advisory Committee Selection (Filing GS2- Committee Selection)
- Preparing a Plan of Study (Filing GS2- Plan of Study)
- Coursework
- Filing Annual Progress Reports (APR)
- Thesis Proposal Preparation and Defense (GS-Research Approval Form)
- Research and Thesis
- Thesis Defense (Filing GS7M)

Each of these requirements are discussed in more detail below.

M.S. Thesis Advisory Committee Overview

The thesis advisory committee should **be established around the end of the first semester**, after the student has begun to identify their research area.

The thesis advisory committee approves the student's degree curriculum, supervises the graduate program, administers the final oral examination during the thesis defense, and initiates the recommendation for the awarding of the M.S. degree. One member of the committee is designated as chair, typically the Faculty Advisor, and normally directs the student's thesis, if required. A minimum of two additional faculty members are to be selected by a student seeking a M.S. degree. Either the Faculty Advisor or at least half of the committee must hold rank in the Biological Sciences or Microbiology programs offering the degree. For Environmental Toxicology graduate students at least half of the committee members need to be associated with the Environmental Toxicology curriculum.

M.S. Advisory Committee Selection (GS2)

Purpose

The purpose of the first part of the online GS2 form is to select your graduate advisory committee.

Deadlines

The GS2: Committee Selection should **be established around the end of the first semester** for M.S. students. This portion of the form must be complete and approved by all committee members before the GS2: Plan of Study can be submitted.

Forms

The online GS2: Committee Selection "form" is available through the iROAR portal. Please follow the directions found on the Graduate School's webpage for submission.

Procedure

Once a student gets to the GS2: Committee Selection online "form", they should select thesis from the "committee type" drop down menu. After that, the student will have the option to add committee members. A drop-down list of faculty will appear for different departments. All faculty eligible to serve on graduate student committees are found on this graduate faculty list.

If the faculty is not on the list but is at Clemson University, contact the appropriate GPC to request approval to add them as a committee member. Once approved, they will be added to the graduate faculty list.

External faculty (outside the university) will appear if all steps for their appointment have been completed as described below. In order for an external member to be awarded graduate faculty status through the Department, the students Faculty Advisor should fill out the email template requesting Graduate Faculty Status found in the BioSci faculty resource folder here and send it along with the external faculty's CV to the Tenure, Promotion, and Reappointment (TPR) committee and the department chair. Their application will be reviewed by the IRC and then the TPR committee, who will vote on it during the next scheduled faculty meeting. Once the external faculty member is approved by the TPR committee, the department chair can approve the workflow request that you initiate in iROAR. See here for directions on adding an external committee member in iROAR.

Once the committee is selected, e-mails will be sent one-by-one in a hierarchical order for approval. An email is first sent to the Faculty Advisor, then each committee member (alphabetically by last name), then the appropriate Graduate Program Coordinator, the chair of the department, the dean of the college, and finally the dean of the Graduate School. Faculty will need to use the Duo system to enter the site to approve the Committee Selection and Plan of Study. Contact the appropriate Graduate Program Coordinator if any help is needed with this process.

M.S. Committee Meeting Times

The committee will meet at a minimum at the following times:

- Prior to the end of the second semester to review the student's planned research and to approve the student's Plan of Study (GS2).
- During the third semester or earlier for the oral defense of the thesis proposal (GSRA).
- At least once a semester, starting in the 4th semester.
- The final semester for the thesis defense (filing GS7M).

M.S. Course Work

Clemson's directory of classes and on-line registration can be found through the iROAR portal. The Graduate Student Catalog can be found at https://catalog.clemson.edu/.

M.S. students must have a minimum of 30 credits hours to graduate. Coursework encompassing the breadth and depth in associated life science areas is expected of all candidates. An appropriate plan of coursework to fulfill this requirement will be developed by the student and their advisory committee and submitted in the Plan of Study (GS2) around the **middle of the second semester**. The Plan of Study must reflect the required 30 credit hours necessary for graduation. At least one-half of the total credit hour required (not including research credits) must be courses that are 8000-level or above. All courses listed in the Plan of Study must be passed with a grade of "B" or higher prior to completion of the graduate degree, even if those courses are not part of the general degree requirements.

Seminar

Micro and BioSci: The Department of Biological Sciences hosts a weekly guest lecturer as part of the departmental seminar series (**BIOL 8120**). For 2025-2026, the seminar will be held on Mondays from 11:15 – 12:05 pm. A wide variety of topics from across all disciplines in Biological Sciences, ranging from microbiology, ecology, evolutionary biology, cell and molecular biology, developmental biology, and others, are presented. This seminar series is to be attended by graduate students in the Biological Sciences and Microbiology programs.

Entox: The Environmental Toxicology seminar (**ETOX 8610**) is the required seminar course for Entox M.S. students.

Credit Requirements: M.S. students must enroll in either **BIOL 8120** or **ETOX 8610** for their first two years (or up to four semesters), which totals to minimum of four credits. Attendance of seminars even when not enrolled is highly encouraged.

Passing Seminar: To pass **BIOL 8120** or **ETOX 8610**, enrolled graduate students are required to attend a minimum of eight of the 10+ Departmental or other approved seminars each semester. Seminars presented in other departments may count towards meeting this requirement, but the student is responsible for getting permission from the faculty coordinator for **BIOL 8120** or **ETOX 8610** of the substitution and documenting attendance by signing in with the coordinator of the seminar they attend. Excused absences (e.g. attendance at scientific meetings, family emergencies) must be approved by the seminar coordinator.

BIOL 8120 Seminar Coordinator: Dr. Anna Seekatz (aseekat@clemson.edu)

ETOX 8610 Seminar Coordinator: Dr. Peter van den Hurk (pvdhurk@clemson.edu)

Reading Groups/Journal Clubs

One of the most profitable and enjoyable aspects of the graduate training program is the student's participation in one or more reading groups. Such discussion groups will teach, develop, and enhance a student's ability to critically read, interpret, discuss, and present scientific literature and results.

BioSci and Micro: M.S. students in these degree programs are required to pass the reading group course (**BIOL 8070 or MICR 8070**). Although the format may vary among the various sections of **BIOL 8070** and **MICR 8070**, each involves a meeting of the faculty and students working in areas of mutual interest to discuss recent developments, findings, and techniques that relate to their research interests. Any exemption from the policy for reading groups requires approval of the Lead Graduate Programs Coordinator.

Entox: Ph.D. students in Environmental Toxicology are required to take and pass the Reading Group course. They can choose from either **BIOL 8070 or MICR 8070**. Any exemption from the policy for Reading Groups requires approval of the Lead Graduate Programs Coordinator.

Credit Requirements: M.S. students in Micro and BioSci are required to enroll in a minimum of four credits of reading group (**BIOL or MICR 8070**). Attendance at other reading groups even when not enrolled is highly encouraged. M.S. students in Entox are required to enroll in a minimum of two credits and a maximum of eight credits of reading group (**BIOL or MICR 8070**).

Passing Reading Group: Participation includes attendance, as well as leading the discussion at least once per semester.

Professional Development Course

This course (**BIOL 8150**) covers topics including how to read a scientific paper, research ethics, failing forward, how to choose a committee, and time management. Students that take this course can count it towards one of their reading group requirements. If they were to do that, Microbiology and Biological Sciences students would have to take three credits of **BIOL or MICR 8070** instead of four credits, and Environmental Toxicology students would have to take one additional credit of **BIOL or MICR 8070** instead of two.

Research Credits

To complete a M.S. degree, students are required to take at least **six** semester hours of thesis research (**BIOL/MICR/ETOX 8910**). Every enrolled graduate student must enroll in *at least* one credit of dissertation research each semester. This research should be led by their Faculty Advisor. Exemption from this policy requires approval from the Lead Graduate Programs Coordinator.

GTA Colloquium

All GTAs are required to register for and pass **BIOL 8130**. This colloquium is a one-hour pass/fail course for all students who have not yet taught as a GTA but ***will be*** teaching assistants in the fall or might be teaching assistants at some time in the future.

Undergraduate Deficiencies

Any undergraduate deficiencies will be annotated in the acceptance letter to the student. These courses should be completed as soon as possible after starting the program.

Seminar Presentation

M.S. students will conduct at least one seminar presentation per year starting in their second year. The seminar may be at an official conference, a seminar to the department, or a research report/update to their committee. If you are curious as to whether a seminar presentation counts, please reach out to your Graduate Program Coordinator.

Program-Specific Coursework

Biological Sciences:

Courses: A minimum core has been chosen to ensure that graduates will be well-rounded biological scientists capable of excelling within a broad interdisciplinary context of Biological Sciences will be taken by each M.S. student. Students are required to take at least one of the courses, offered in the fall semester, below:

- **BIOL 8000** Concepts in Evolution, Ecology and Organismal Biology
- **BIOL 8010** Concepts in Molecular, Cellular and Developmental Biology

Environmental Toxicology:

Courses: A minimum core has been chosen to ensure that graduates will be well-rounded toxicologists capable of excelling within a broad interdisciplinary context of Environmental Toxicology will be taken by each M.S. student. These are as follows:

- **ETOX 6300** Toxicology
- **ETOX 6370** Ecotoxicology

While no longer required, there are additional courses that are optional for students but may be useful for their studies. Students should consult their Faculty Advisor to see if they recommend these courses:

- **EES 8430 or 8450** Environmental Chemistry or Environmental Organic Chemistry
- **ETOX (BIOL) 8300** Mechanistic Toxicology
- **Statistics** STAT 8010, STAT 8050, or another appropriate course

Microbiology:

Courses: A minimum number of courses chosen to ensure that graduates will be well-rounded microbiologists capable of excelling within the broad interdisciplinary context of Microbiology will be taken by M.S. student. These are as follows:

Our two core courses include:

- **MICR 8000** Microbial Structure and Function; Bacterial Physiology/Diversity; Environmental and Ecological Microbiology
- **MICR 8010** Bacterial Genetics; Microbial Evolution/Genomics; Eukaryotic and Prokaryotic Pathogenesis

One additional specialty course from one of the following emphasis areas is offered either in fall or spring semesters.

- Genetics, Physiology and Metabolism
- Pathogenic Microbiology
- Environmental and Ecological Microbiology
- Technology
- Bioinformatics, Genomics and Statistics

M.S. Plan of Study (GS2)

Purpose
The purpose of the GS2: Plan of Study is to document the plan for coursework upon which the student and committee have agreed.

Deadlines
A student should plan on filling out *two* Plans of Study during their degree. The first one is due around **the middle of the second semester** for M.S. students. ***If*** the courses taken changes before the student graduates, an updated plan with the courses that have been taken must be filed. This updated plan is generally filed in the beginning of the semester that the student intends to graduate. Please see the graduate school's exact deadlines for this here.

Form
As with the Committee Selection, the online GS2 "form" is available through the iROAR portal. Please follow the directions found on the Graduate School's webpage for submission.

Courses
Students should list courses (formal or research) to total 30 credits. This coursework is decided between the student and their advisory committee.

Do not list courses completed more than those required by the advisory committee. A student can take as many credits as they like (within reason), but only the courses required by the advisory committee, our graduate programs (i.e., the Biological Sciences seminar and reading group courses), and research credits should be listed on the Plan of Study.

Contact the appropriate Graduate Program Coordinator if there are any have any questions.

Approval

As with the committee selection, e-mails will be sent one-by-one in a hierarchical order for approval. An email is first sent to the GSSC, then the Faculty Advisor, committee co-chair (if applicable), the appropriate Graduate Program Coordinator, and then Graduate Enrolled Student Services.

		Typical MS Student	
Course	**Credits**	**Notes**	
Reading Group (BIOL/MICR 8070)	4	Only 2 credits required for EnTox	Total course credits ≥ 24 (at least 12 credits at 8000-level)
Seminar (BIOL 8120/ETOX 8610)	4		
GTA Colloquium (BIOL 8130)	1		
Other course (6000+)	3	**Bio Sci:** students must take BIOL 8000 or BIOL 8010 **EnTox:** ETOX 6300, ETOX 6370 are required. A quantitative biology course such as statistics is recommended. **Micro:** students should take MICR 8000 or MICR 8010	
Other course (6000+)	3		
Other course (6000+)	3		
Other course (6000+)	3		
Other course (6000+)	3		
Research Credits (BIOL/ETOX/MICR 8910)	6	Minimum of 6 research credits	
TOTAL CREDITS	**30**	**Minimum of 30 credits total**	

Annual Progress Reports

Graduate students annually self-report on their progress in research, accomplishments of milestones towards degree (e.g. completion of Program of Study, Proposal Defense, or Comprehensive Exams), awards and honors received, and dissemination of results (papers published, presentations made). This annual progress report serves two important purposes. First, it allows the Program Coordinators and GAC to keep tabs on the progress of graduate students in the program and spot struggling students early. Second, it allows for better assessment of the programs in terms of student measures of success such as dissemination of research results. It is also recommended that student progress reports be emailed by the student to all committee members each year.

An email is sent out each year with a link to a form that must be filled out no later than two weeks following receipt.

Failure to file a progress report annually is considered as lack of adequate progress towards degree. A letter will be sent to both student and faculty advisor and continued non-compliance will result in the student's file being reviewed by GAC to determine the consequences of this

failure.

M.S. Thesis Proposal Preparation and Defense

All graduate students in Biological Sciences, Environmental Toxicology, or Microbiology must prepare a written research proposal outlining the student's dissertation research project for discussion and approval by the Advisory Committee **by the end of the third semester.** The proposal will be written in federal grant style (NIH, NSF, USDA, etc.). Please meet with your advisor to discuss what format would be most ideal for your proposal. Once you have come to a decision, please inform your committee of the format of your proposal. **The proposal must be provided to the committee *at least* 14 days before the defense. An email should be sent to the appropriate GPC stating that the proposal has been sent.**

An oral seminar outlining the research plan is presented to the Thesis Advisory Committee and orally defended by the student for final approval following the proposal seminar. Master's students are not required to make this an open seminar but may do so if they so choose. If you do choose to make this a public proposal defense, please follow the same directions in the "M.S. Research and Thesis Defense" section below. Please contact biolgrad@clemson.edu if you would like to make it open.

Upon successful defense by the student, the student and committee members will fill out and submit the GS-Research Approval Form (fillable form) to the grad school with a copy to the GSSC, biolgrad@clemson.edu. Students may be asked to revise their proposals and re-defend with the advisory committee, or enroll in more courses, if the committee feels such actions are warranted as a result of their first defense.

Use the GS-Research Approval Form
The GSSC will send the form through Adobe Sign on behalf of the student.

Once the form is completed and signed, it will be placed in your file and sent to the appropriate person at enrolled student services.

M.S. Research and Thesis Defense

Master's students are expected to generate a satisfactory thesis based upon results of a research project designed by the student in conjunction with their advisory committee. **The research should be an original contribution to the student's field of choice, and it is highly recommended that the scope of the project be sufficient to result in at least one publication in a quality peer-reviewed journal.** The student is expected to devote a considerable amount of time to research, even while completing coursework and teaching as time management will be crucial in all their future work. The GAC expects students to submit a manuscript from their thesis within one year of graduation.

At the end of the program, a student will defend their thesis research. The defense will include a public departmental seminar in which the student presents the results of their research and followed by a "closed-door" oral defense of the research with the advisory committee. The thesis *must* be provided to the committee **at least 14 days before the defense**. **An email should be sent to the appropriate GPC stating that the dissertation has been sent.** The defense must also occur at least one full

week (seven days) before the final manuscript is due to the Graduate School. Please see the information below on how to schedule your final defense.

This final oral exam consists of general questions covering the discipline and mastery of skills and questions challenging the thesis Students should prepare for the general questions through review of their classwork, and by remaining current in the literature related to their field of study. The defense of the dissertation will focus on the hypotheses, methods, results, and conclusions in the thesis, so the students should be thoroughly conversant with all aspects of the research.

Procedure for Organizing Your Thesis Defense

The following outlines the steps in scheduling the defense, advertising the defense, filing the appropriate form with the Graduate School once the student has successfully completed their defense, and filing the appropriate assessment form with the Department. See here for all deadlines *well in advance* of the semester the student plans to defend. Note that the student must be enrolled for at least one credit during the semester they plan to defend (usually BIOL/ETOX/MICR 8910 but can be anything) and the student must apply for graduation through iROAR at the beginning of the semester in which they plan to defend.

If the student can complete all their requirements, including an accepted manuscript, before classes begin in the coming semester, they will be cleared to graduate at the end of that semester without having to enroll in credit hours or pay tuition. The student should check with enrolled services for the exact deadline for each semester and notify them if there is a delay in their graduation.

M.S. students must pass the oral examination, i.e. the thesis defense, at least three weeks prior to the commencement ceremony.

Reserve a Seminar Room

The student should contact Ms. Amanda Roberts (864-656-2328; aorr2@clemson.edu) at least four weeks in advance of the date they want to defend their proposal. Be sure to let her know this is the **final defense**, as well as the defense date, time, and room preference(s). She can also help choose a room. Some common rooms for public proposal defenses include the Jordan Room, Long 229, LSF 026, 142, and 242; BRC 100; and Poole E-142. Amanda can reserve the Jordan Room and the Long Hall rooms directly. She can fill out the forms to request LSF rooms or BRC rooms. She can also request Poole E-142, which has videoconferencing abilities, through Kate Price (kgthoma@clemson.edu). If Amanda is unavailable, email BiolSci@clemson.edu for assistance.

Announce Your Defense

At least 10 days before a thesis defense, the student should email an announcement of their defense with the flyer attached (see below) to their Faculty Advisor, committee members, and the GSSC, biolgrad@clemson.edu.

The contents of the announcement should be **in the body of the email**. The contents include the student's name (the name of the person defending); what they are defending (M.S. Thesis); the title of the talk; the date, time, and location of the talk; and the Faculty Advisor's name.

The student should include this information on a flyer in a separate attachment with the email as well. The flyer should have the following format:

Title of Thesis
(Title should be in 12 point Arial or Times New Roman font and centered)

Author's name

M.S. Defense Advisor's name:

Names of committee members:

Date & Time

Location – zoom link or physical location. Information between here and title should be in 11 point Arial or Times New Roman font and centered.

The abstract, less than one page, if possible, should be included. The text of the above should be included in an email and as a separate PDF for distribution. Small photos and/or graphics can be included. A GOOD diagram (something that would, by itself, explain your proposed research to any interested persons) that can be used in place of a description of your research. An image related to your research (photo, graph, computer generated image, etc.) may also be provided.

The student should post the flyer on the Seminar Board near the main BioSci Office and on various boards in Long and Jordan Halls and the LSF, if appropriate.

Remote Dissertation Support

For any assistance with teleconferencing: Contact ithelp@clemson.edu for assistance.

To set up a virtual meeting, the Faculty Advisor should create the Zoom meeting with a waiting room, invite people in, and record the defense in the cloud. The waiting room, passwords and invites prevents random people from joining the Zoom room and interrupting the proposal defense. Clemson University provides excellent support for Zoom.

Graduate School policy permits proposal defenses to be delivered virtually if the defense is a synchronous event for the committee members. As this method is being employed more extensively than originally anticipated, the resources shared here are intended to support this process for all involved.

A link was forwarded to a post by Ashton Merck, who had a virtual dissertation defense and shared many excellent suggestions for both the defending student, as well as the faculty committee.

Use the GS7M form and Thesis Rubrics
A successful "Pass" of the defense will result in filing the GS7M form with the Graduate School.

The GSSC will send the GS7M form through Adobe Sign to all the committee members for approval. Once it has been signed, the GSSC will add the completed form to the student's file and send a copy to Enrolled Student Services.

The committee will assess the student for departmental assessment purposes using a set of rubrics on a form (examples in Appendices IV-VI). The GSSC will send the form to the advisor after the comprehensive exam is completed and the advisor will submit the form with the committee's consensus evaluation after the final defense to the GSSC, biolgrad@clemson.edu.

Guide for Formatting and Submitting of Your Dissertation

The Graduate School requires that all master's theses be submitted in electronic format. Guidelines for electronic format of theses can be found on the Graduate School webpage. The official copy of the thesis must be submitted to the Graduate School in this electronic format and approved before a degree will be awarded.

In addition to the electronic copy of the thesis document required by the Graduate School, you have the option to purchase bound copies through a vendor. A signature page from the advisory committee (not available in the electronic copy) can be included in the bound copy, and there is an option to print the figures in color. Please visit this page for more information.

Graduation Guidelines

The semester that the student intends to graduate, there are a list of procedures the student must do by specific deadlines to graduate on time. The list of these deadlines can be found here: Graduation Deadlines for Completing Your Program and there is more information about them below.

Final GS2 Form: Towards the beginning of the semester that the student graduates, the student may need to resubmit their GS2 form. This only needs to be done if the core courses that count toward the degree have changed since the original version was submitted. If a course has changed, but it is not one of the ones strictly required for graduation, the form does not need to be resubmitted. Students that submit this form after the deadline will be charged money, so be sure to check the deadline.

Apply to Graduate: At the beginning of the semester that the student intends to graduate, they will need to formally apply to graduate through iROAR. To do this, access the iROAR page. Select "Student Record." Then, select "Apply to graduate." If questions arise during this process, please reach out to enrolled student services at essrecs@clemson.edu.

Schedule your Defense: Reach out to Amanda Roberts (see directions above) at least four weeks in advance of the defense to reserve a room. Then, 10 days before the defense, the student will need to inform the GSSC about their defense by emailing them the flyer to biolgrad@clemson.edu. Finally, they need to submit the date, time, and location of your defense to the Graduate School by submitting the "Submit Defense Form", which can be found here: Add Your Defense to the Calendar | Graduate School.

File your GS7M: The GS7M needs to be submitted to enrolled student services at least one week

before your completed dissertation is due. The GSSC will send the GS7M form through Adobe Sign to all the committee members for approval. Once it has been signed, the GSSC will add the completed form to the student's file and send a copy to enrolled student services.

Submit your Completed Thesis: Once the committee has agreed on the final version of the thesis, it will need to be submitted to the Manuscript Review Office (Submit Your Thesis/Dissertation). This needs to be done at least three weeks before graduation.

Submit your Revised, Final Thesis: The Manuscript Review Office may have minor edits for the formatting of the manuscript. They will email these edits in one to two business days. The student will have one week from the initial submission to turn in the final, edited manuscript.

Commencement: Commencement is always held at the Littlejohn Coliseum. The schedule for the commencement ceremony for students can be found here: Commencement | Clemson University. Tickets are not required, but students can have a maximum of six guests at the ceremony. Regalia needs to be ordered in advance, at least one month before commencement, and is done through the Clemson University Barnes & Noble Bookstore to determine that.

M.S. Student Financial Support / Tuition / Fees

Teaching and Research Assistantships

Graduate students accepted into the Biological Sciences, Environmental Toxicology or Microbiology graduate programs are either awarded support through the Department of Biological Sciences as Graduate Teaching Assistants (GTAs) or from individual faculty advisors' sponsored grant funds as Graduate Research Assistants (GRAs). A student may be both a GTA and a GRA during their time at Clemson depending on their faculty advisor's grant funding. Students can work a maximum of 28 hours a week if they are a U.S. citizen and 20 hours a week if they are an international student.

To be eligible for a GTA or GRA, a student must be enrolled full-time. Full-time status entails registering for a minimum of nine credit hours during the fall and spring semesters. If a student's assistantship continues into the summer, then the student must be enrolled in three credit hours in each summer session or six credit hours in the long summer session. A GTA/GRA can be terminated at any time for substandard, unsatisfactory, or unethical performance. The annual progress report letter sent by GAC each August identifies problems with performance or progress toward the degree and sets deadlines for resolving the problems (see section the Annual Progress Section above for more details).

GTAs are awarded upon acceptance to the program and may be renewed annually based upon performance in teaching and satisfactory progress towards degree for up to three years (six semesters). The current rate for a 9-month appointment (not teaching in the summer) is $24,000 for M.S. students. Annual GTA stipends may be supplemented by Faculty Advisors' grant funds or from other sources. Additional GTA support may be available with satisfactory research progress towards the degree and permission from the GAC and department chair.

GRAs are awarded by individual Faculty Advisors with funds available from research grants. Individual stipend amounts and conditions of renewal are determined by individual Faculty

Advisors, but currently funded GRA stipends of at least $24,000. This will depend on the tenure of the student (years in program) and availability of supplemental funds. GRA support is negotiated by prospective students with individual Faculty Advisors.

Summer funding is not guaranteed, so students should be sure to save money during the fall and spring semesters to support themselves over the summer semester. During the summer months, graduate students may be employed on an assistantship or on an hourly basis. Graduate students on an assistantship in the summer must enroll in at least three credits for each of the two summer sessions. Graduate students employed on an hourly basis do not need to register for courses over the summer.

A limited number of university fellowships are available on a competitive basis by nomination. The GAC will inform students of these opportunities. We also encourage graduate students submit proposals for outside funding, such as an NSF GRFP.

The department currently offers one or two competitive spring semester Professional Development GRAs to Ph.D. students finishing their dissertations within 18 months. The stipends are at the same rate as a GTA and come with $2,000 incentive supplement and full tuition coverage for one semester. These awards are based on the student's past and current plans for professional development and research success. The $2,000 incentive funds are for professional development opportunities only. Applications for these professional development awards will be solicited in the Fall semester.

The department (through the university) also currently offers two competitive Interdisciplinary Fellowships to Ph.D. students whose research is interdisciplinary. These supplementary awards to the graduate student stipend will be solicited in the spring or summer and awarded the following academic year. Other fellowships/awards are listed below in the table and are solicited in the spring and awarded the following academic year. The student can apply with one cover letter for all eligible fellowships, but they need to state in the cover letter which fellowship(s) they are applying for and explain why they are eligible to apply.

Fellowship name	Target applicants and eligibility
Alex P. Anderson and Lydia Anderson Fellowship	Graduate students conducting advanced research in biological sciences (including bacteriology and entomology). NOTE: The student must already hold a Clemson University degree at any level.
Dr. Harry Findley ('71) and Catherine T. Findley Student Assistance Endowment	Graduate students studying microbiology or biology within the Department of Biological Sciences in the College of Science.

Dr. David W. Tonkyn Memorial Annual Fellowship	Fellowship for graduate students enrolled in Biological Sciences that is studying conservation and/or endangered species.

M.S. Program Timetable

Requirement	Relevant Form	Deadline (deadline for students entering Fall 2025)
Advisory Committee Selection	Online, GS2	By end of Semester 1 (December 2025)
Plan of Study	Online, GS2	By end of Semester 2 (May 2026)
Thesis Proposal and Defense	GS-Research Approval	By end of Semester 3 (December 2026)
Thesis Submission / Defense	GS7M, Rubric	By end of Year 3 (May 2028)
Annual Progress Report (APR)	APR	Every year
Research Presentation	APR	Every year
Seminar Attendance (BIOL 8120/ETOX 8610)	APR	Must be enrolled in years 1 and 2. Recommended attendance otherwise.
Reading Group Attendance (BIOL 8070 or MICR 8070)	APR	Must be enrolled in years 1 and 2. Suggested attendance otherwise.

APR = Annual Progress Report

III. PH.D. PROGRAM INFORMATION

Graduate school policies and procedures

The final authority resides with the Graduate School. Their policies and procedures can be found here: Graduate School Policy Handbook.

A. Ph.D. Rotation Program

Some students in the Biological Sciences or Microbiology Ph.D. program enter as rotation students. Students are required to conduct a minimum of three rotations before requesting a faculty advisor. In some cases, a fourth rotation may be necessary. This option should be discussed before the end of the third rotation with the Lead GPC. Rotation students are expected to contact and meet individually with faculty members to discuss possible rotation projects and expectations prior to requesting a rotation in that lab. A great place to learn about different faculties research is at the BioSci Research Expo which is held near the beginning of the Fall Semester each year. They submit their choices to the Lead Graduate Program Coordinator and the GSSC. The Lead Graduate Program Coordinator will work with the faculty to decide the order of the rotations, to accommodate both the faculty advisor and the student's preferences. Once the order has been determined the student will be informed via email.

Students spend seven weeks in each lab. At the start of each rotation, students should communicate with their rotation advisor about expectations and requirements to learn, engage and succeed in the research experience. The student is expected to abide by these recommendations and stay in contact with their rotation advisor throughout the rotation period. At the end of each rotation, the GSSC will send each student and faculty member an evaluation to determine how they both felt the rotation went.

Rotation Program Timeline

For 2025-2026:

- BioSci research expo: **August 18, 2025**
- Deadline when students submit their top three preferences for their 1st rotation: **Sept 8th**
- Date first rotation starts: **Sept. 15th**
- Date first rotation ends: **Oct. 24th**
- Deadline when students submit their preferences for 2nd rotation: **Oct. 15th**
- Date second rotation starts: **Oct. 27th**
- Date second rotation ends: **December 12th** (3 days off for Thanksgiving)
- Deadline when students submit their preferences for 3rd rotation: **Nov. 30th**
- Date third rotation starts: **January 12th, 2026**
- Date third rotation ends: **February 20th, 2026**

Rotation Program Course Requirements

During their first year, rotation students sign up for BIOL or MICR 9910 (2 credits) with the

appropriate Graduate Program Coordinator. For Fall 2025, this is section 009 for MICR 9910 with Dr. Emily Rosowski is for rotation students. Each rotation advisor submits an evaluation form sent by the GSSC at the end of each rotation. The Pass/Fail grade for the fall semester is based on the first and second rotations, and the grade for the spring semester is based on the third (and possibly the fourth) rotation. If students receive three recommendations of "Fail" by rotation advisors, they will therefore receive a "Fail" in the Fall and Spring semesters (if necessary) and be recommended for dismissal by the Graduate School. Evaluation forms for both the student and faculty advisor are found in Box (BioSci Resources/Faculty Resources) but will be emailed by the GSSC.

Choosing a Faculty Advisor from your Rotation Program

- Meet with the rotation advisor at the end of each rotation to discuss potential projects.
- Submit rotation evaluations to the Rotation Coordinator within three days of the end of each rotation.
- The student should stay in touch with any rotation advisor that they are interested in working with.
- At the end of the third rotation, the student should contact the Rotation Coordinator with a ranking of their advisor/laboratory choices.
- The Rotation Coordinator will review student and faculty evaluations and contact the faculty that the student is interested in joining.
- If the faculty member is agreeable, then the student will be encouraged to directly contact the faculty member to discuss the specifics of joining their lab.
- If both the faculty member and the student are amenable to the student joining that lab, then no further action is needed. If that is not the case, the L will advise the student to reach out to their other options until they find one that works.

B. Ph.D. Program Rules, Requirements, and Policies

Below are degree requirements for students who enter the Department of Biological Sciences for one of the following three Ph.D. programs: Biological Sciences, Environmental Toxicology, or Microbiology.

The Doctor of Philosophy degree is the highest degree offered by Clemson University. It is conferred only for work of distinction in which the student displays original scholarship. The major emphasis of the doctoral program in Biological Sciences, Environmental Toxicology, or Microbiology is to provide an environment for the student to learn how to think critically, pose questions and answer them by experimentation, perform library research, write, communicate in scientific formats, and develop into a mature, articulate, and competent scientist.

It is the graduate student's responsibility to stay in touch with their Faculty Advisor and graduate advisory committee and ensure all requirements are fulfilled. The GPCs, Faculty Advisor, and GSSC will check in periodically with each student to see how they are progressing in their program. If they do not make progress towards their degree, there will be a discussion as to how the student can improve. If the student still does not make progress towards their degree, they may be dismissed from the program.

The student is ultimately responsible for complying with the regulations of the Department of

Biological Sciences and Clemson University Graduate School, and being aware of all procedures, deadlines, etc. as they may not be reminded by faculty. Graduate School policies and procedures can be found in the Graduate School Policy Handbook.

Ph.D. Program Requirements

The Doctoral Program involves the following procedures (for more information about each procedure, please see the sections below):

- Dissertation Advisory Committee Selection (Filing GS2- Committee Selection)
- Preparing a Plan of Study (Filing GS2- Plan of Study)
- Coursework
- Filing Annual Progress Reports (APR)
- Dissertation Proposal Preparation and Defense (GS-Research Approval Form)
- Comprehensive Exam (Filing GS5D)
- Research and Dissertation
- Dissertation Defense (FilingGS7D)

Each of these requirements are discussed in more detail below.

Ph.D. Dissertation Advisory Committee Overview

The advisory committee is **established around the end of the third semester (the second fall semester)** *after* the student has begun their program. This committee is expected to meet *at least* once per year and additionally as needed.

The advisory committee approves the student's degree curriculum, supervises the graduate program, administers the Ph.D. comprehensive exams and the final oral examination during the dissertation defense, and initiates the recommendation for the awarding of the Ph.D. degree. One member of the committee is designated as chair, typically the Faculty Advisor, and normally directs the student's dissertation, if required. A minimum of three additional faculty members beyond the chair are to be selected by a student seeking a doctoral degree.

Either the Faculty Advisor or at least half of the committee must hold rank in the Biological Sciences or Microbiology programs offering the degree. For Environmental Toxicology graduate students at least half of the committee members need to be associated with the Environmental Toxicology curriculum.

Ph.D. Advisory Committee Selection (GS2)

Purpose

The purpose of the first part of the online GS2 form is to select the graduate advisory committee.

Deadlines

The GS2: Committee Selection **by the end of the third semester (the second fall semester)** for Ph.D. students. This portion of the form must be complete and approved by all committee members before the GS2: Plan of Study can be submitted.

Forms

The online GS2: Committee Selection "form" is available through the iROAR portal. Please follow the directions found on the Graduate School's webpage for submission.

Procedure
Once a student gets to the GS2: Committee Selection online "form", they should select thesis from the "committee type" drop down menu. After that, the student will have the option to add committee members. A drop-down list of faculty will appear for different departments. All faculty eligible to serve on graduate student committees are found on this graduate faculty list.

If the faculty is not on the list but is at Clemson University, contact the appropriate GPC to request approval to add them as a committee member. Once approved, they will be added to the graduate faculty list.

External faculty (outside the university) will appear if all steps for their appointment have been completed as described below. In order for an external member to be awarded graduate faculty status through the Department, the students Faculty Advisor should fill out the email template requesting Graduate Faculty Status found in the BioSci faculty resource folder here and send it along with the external faculty's CV to the Tenure, Promotion, and Reappointment (TPR) committee and the department chair. Their application will be reviewed by the IRC and then the TPR committee, who will vote on it during the next scheduled faculty meeting. Once the external faculty member is approved by the TPR committee, the department chair can approve the workflow request that you initiate in iROAR. See here for directions on adding an external committee member in iROAR.

Once the committee is selected, e-mails will be sent one-by-one in a hierarchical order for approval. An email is first sent to your advisor, then each committee member (alphabetically by last name), then the appropriate Graduate Program Coordinator, the Chair of the Department, the Dean of the College, and finally the Dean of the Graduate School. Faculty will need to use the Duo system to enter the site to approve the Committee Selection and Plan of Study. Contact the appropriate Graduate Program Coordinator if any help is needed with this process.

Ph.D. Committee Meeting Times

The committee will meet at a minimum at the following times:

- No later than the end of the third semester (the second fall semester) to review the student's planned research and to approve the student's Plan of Study.
- No later than end of the second year for the Oral Defense of the Dissertation Proposal (GS-Research Approval Form).
- Beginning of third year to inform the committee of their choice for Comprehensive Exam format.
- No later than end of third year for Comprehensive Exam orals (filing GS5D).
- A minimum of one time in the fourth and fifth years to review progress.
- No later than the end of five years after filing the GS5D for the Dissertation Defense (filing GS7D), unless they have permission to continue beyond five years.

Ph.D. Course Work

Clemson's Directory of Classes and on-line registration can be found through the iROAR portal. The Graduate Student Catalog can be found at Clemson University - Modern Campus Catalog™.

Ph.D. students must have a minimum of 60 credits hours to graduate; 30 of these credits must be beyond the master's degree if one was previously obtained. At least 12 credit hours of coursework must be taken by students who are pursuing a Ph.D. without having a M.S. degree. Coursework encompassing the breadth and depth in associated life science areas is expected of all candidates. An appropriate plan of coursework to fulfill this requirement will be developed by the student and their advisory committee and submitted in the Plan of Study (GS2) around the **end of the third semester (the second fall semester)**. The Plan of Study must reflect the required 60 credit hours necessary for graduation. All courses listed in the Plan of Study must be passed with a grade of "B" or higher prior to completion of the graduate degree, even if those courses are not part of the general degree requirements.

Seminar

Micro and BioSci: The Department of Biological Sciences hosts a weekly guest lecturer as part of the Departmental Seminar series (**BIOL 8120**). For 2025-2026, the seminar will be held on Mondays from 11:15 – 12:05 pm. A wide variety of topics from across all disciplines in Biological Sciences, ranging from microbiology, ecology, evolutionary biology, cell and molecular biology, developmental biology, and others, are presented. This seminar series is to be attended by graduate students in the Biological Sciences and Microbiology programs.

Entox: The Environmental Toxicology seminar (**ETOX 8610**) is the required seminar course for Entox Ph.D. students.

Credit Requirements: Ph.D. students must enroll in either **BIOL 8120** or **ETOX 8610** for their first three years (or up to six semesters), which totals to minimum of six credits. Students should not take more than eight credits for either of these courses. Students with credit for **BIOL 8120** from their MS degree are required to take up to six credits between the two degrees. Attendance of seminars even when not enrolled is highly encouraged.

Passing Seminar: To pass **BIOL 8120** or **ETOX 8610**, enrolled graduate students are required to attend a minimum of eight of the 10+ Departmental or other approved seminars each semester. Seminars presented in other departments may count towards meeting this requirement, but the student is responsible for getting permission from the faculty coordinator for **BIOL 8120** or **ETOX 8610** of the substitution and documenting attendance by signing in with the coordinator of the seminar they attend. Excused absences (e.g. attendance at scientific meetings, family emergencies) must be approved by the Seminar Coordinator.

BIOL 8120 Seminar Coordinator: Dr. Anna Seekatz (aseekat@clemson.edu)

ETOX 8610 Seminar Coordinator: Dr. Peter van den Hurk (pvdhurk@clemson.edu)

Reading Groups/Journal Clubs

One of the most profitable and enjoyable aspects of the graduate training program is the student's participation in one or more Reading Groups. Such discussion groups will teach,

develop, and enhance a student's ability to critically read, interpret, discuss, and present scientific literature and results.

BioSci and Micro: Ph.D. students in these degree programs are required to pass the Reading Group course (**BIOL 8070 or MICR 8070**) Although the format may vary among the various sections of **BIOL 8070** and **MICR 8070**, each involves a meeting of the faculty and students working in areas of mutual interest to discuss recent developments, findings, and techniques that relate to their research interests. Any exemption from the policy for Reading Groups requires approval of the Lead Graduate Programs Coordinator.

Entox: Ph.D. students in Environmental Toxicology are required to take and pass the Reading Group course. They can choose from either **BIOL 8070 or MICR 8070**. Any exemption from the policy for Reading Groups requires approval of the Lead Graduate Programs Coordinator.

Credit Requirements: Ph.D. students in Micro and BioSci are required to enroll in a minimum of six credits and a maximum of eight credits of reading group (**BIOL or MICR 8070**). Students with credit for a reading group from their MS degree are required to take up to six credits between the two degrees. Attendance at other reading groups even when not enrolled is highly encouraged. Ph.D. students in Entox are required to enroll in a minimum of two credits and a maximum of eight credits of reading group (**BIOL or MICR 8070**). Students with credit for a reading group from their MS degree are required to take up to two credits between the two degrees.

Passing Reading Group: Participation includes attendance, as well as leading the discussion at least once per semester.

Professional Development Course

This course (**BIOL 8150**) covers topics including how to read a scientific paper, research ethics, failing forward, how to choose a committee, and time management. Students that take this course can count it towards one of their reading group requirements. If they were to do that, Microbiology and Biological Sciences would have to take five credits of **BIOL or MICR 8070** instead of six credits, and Environmental Toxicology students would have to take one additional credit of **BIOL or MICR 8070** instead of two.

Research Credits

To complete a Ph.D., students are required to take at least 18 semester hours of dissertation research (**BIOL/MICR/ETOX 9910**). Every enrolled graduate student must enroll in *at least* one credit of dissertation research each semester. This research should be led by their Faculty Advisor. Exemption from this policy requires approval from the Lead Graduate Programs Coordinator.

GTA Colloquium

All GTAs are required to register for and pass **BIOL 8130**. This colloquium is a one-hour pass/fail course for all students who have not yet taught as a GTA but ***will be*** teaching assistants in the Fall or might be teaching assistants at some time in the future.

Undergraduate Deficiencies

Any undergraduate deficiencies will be annotated in the acceptance letter to the student. These courses should be completed as soon as possible after starting the program.

Seminar Presentation

Ph.D. students will conduct at least one seminar presentation per year starting in their second year. The seminar may be at an official conference, a seminar to the department, or a research report/update to their committee. If there is any question as to whether a seminar presentation counts, please reach out to the appropriate graduate program coordinator.

Program-Specific Coursework

Biological Sciences:

A minimum core of course has been chosen to ensure that graduates will be well-rounded biological scientists capable of excelling within a broad interdisciplinary context of Biological Sciences will be taken by each Ph.D. candidate. Students are required to take at least one of the courses, offered in the Fall semester, below:

- **BIOL 8000** Concepts in Evolution, Ecology and Organismal Biology
- **BIOL 8010** Concepts in Molecular, Cellular and Developmental Biology

Environmental Toxicology:

A minimum core of courses chosen to ensure that graduates will be well-rounded toxicologists capable of excelling within a broad interdisciplinary context of Environmental Toxicology will be taken by each Ph.D. candidate. These are as follows:

- **ETOX 6300** Toxicology
- **ETOX 6370** Ecotoxicology
- **ETOX 8610** Seminar in Environmental Toxicology

While no longer required, there are two additional courses that are optional for students but may be useful for their studies. Students should consult their Faculty Advisor to see if they recommend these courses:

- **EES 8340 or 8450** Toxicology
- **Statistics** STAT 8010, STAT 8050, or another appropriate course

Microbiology:

A minimum number of courses chosen to ensure that graduates will be well-rounded microbiologists capable of excelling within the broad interdisciplinary context of Microbiology will be taken by each Ph.D. candidate. For students entering the Ph.D. program in Microbiology directly from a bachelor's program, graduate coursework must include two core Microbiology courses and one additional course. For students entering the Ph.D. program in Microbiology with a master's degree, they need to either take the courses below or have similar courses that they have taken during their MS program. Students in the latter situation should consult with their faculty advisor and advisory committee to determine which courses are expected of them.

Our two core courses include:

- **MICR 8000** Microbial Structure and Function; Bacterial Physiology/Diversity; Environmental and Ecological Microbiology
- **MICR 8010** Bacterial Genetics; Microbial Evolution/Genomics; Eukaryotic and Prokaryotic Pathogenesis

One additional specialty course from one of the following emphasis areas is offered either in fall or spring semesters.

- Genetics, Physiology and Metabolism
- Pathogenic Microbiology
- Environmental and Ecological Microbiology
- Technology
- Bioinformatics, Genomics and Statistics

Ph.D. Plan of Study (GS2)

Purpose

The purpose of the GS2:Plan of Study is to document the plan for coursework upon which the student and committee have agreed.

Deadlines

A student should plan on filling out *two* Plans of Study during their degree. The first one is due around **the end of the third semester (the second fall semester)** for Ph.D. students. If the core courses taken changes before the student graduates, an updated plan with the courses that have been taken must be filed. This update plan is generally filed in the beginning of the semester that the student intends to graduate. Please see the graduate school's exact deadlines for this here.

Form

As with the Committee Selection, the online GS2 "form" is available through the iROAR portal. Please follow the directions found on the Graduate School's webpage for submission.

Courses

Students should list courses (formal or research) to total 30 or 60 credits depending on whether they do or do not have a previous MS degree. This coursework is decided between the student and their advisory committee.

The total is determined based on the following:

- Ph.D. students coming in with a M.S. degree in hand need 30 credits
- Ph.D. students coming in with only a B.S./B.A. degree need 60 credits

Do not list courses completed more than those required by the advisory committee. A student can take as many credits as they like (within reason), but only the courses required by the advisory committee, our graduate programs (i.e., the Biological Sciences Seminar and Reading Group courses), and research credits should be listed on the Plan of Study.

Contact the appropriate Graduate Program Coordinator if you have any questions.

Approval

As with the committee selection, e-mails will be sent one-by-one in a hierarchical order for approval. An email is first sent to the GSSC, then your advisor, committee co-chair (if applicable), the appropriate Graduate Program Coordinator, and then Graduate Enrolled Student Services.

Typical Ph.D. student without MS			
Course	**Credits**	**Notes**	
Reading Group (BIOL/MICR 8070)	6	Only 2 credits required for EnTox	Total course credits ≥ 12 due to Reading Group/Seminar requirements
Seminar (BIOL 8120/ETOX 8610)	6		
GTA Colloquium (BIOL 8130)	1		
Other course (6000+)	3	**Bio Sci:** students must take BIOL 8000 or BIOL 8010 **EnTox:** students must ETOX 6300 and ETOX 6370 **Micro:** students should take MICR 8000 or MICR 8010	
Other course (6000+)	3		
Other course (6000+)	3		
Research Credits (BIOL/ETOX/MICR 9910)	28	Minimum of 18 research credits	
TOTAL CREDITS	**60**	**Minimum of 60 credits total**	

Typical Ph.D. student with MS from elsewhere			
Course	**Credits**	**Notes**	
Reading Group (BIOL/MICR 8070)	6	Only 2 credits required for EnTox	Total course credits ≥ 12 due to Reading Group/Seminar requirements
Seminar (BIOL 8120/ETOX 8610)	6		
GTA Colloquium (BIOL 8130)	1		
Other course (6000+)	3	**Bio Sci:** students must take BIOL 8000 or BIOL 8010 **EnTox:** students must ETOX 6300 and ETOX 6370 **Micro:** students should take MICR 8000 or MICR 8010	
Other course (6000+)	3		
Research Credits (BIOL/ETOX/MICR 9910)	18	Minimum of 18 research credits	
TOTAL CREDITS	**30**	**Minimum of 30 credits total**	

Typical Ph.D. student with MS from Dept. of Biological Sciences at Clemson			
Course	**Credits**	**Notes**	
Reading Group (BIOL/MICR 8070)	2	Have already taken 4 during MS; Not required for EnTox	Total course credits ≥ 12
Seminar (BIOL 8120/ETOX 8610)	2	Have already taken 4 during MS	
Other course (6000+)	3		
Other course (6000+)	3		
Other course (6000+)	3		
Research Credits (BIOL/ETOX/MICR 9910)	20	Minimum of 18 research credits	
TOTAL CREDITS	**30**	**Minimum of 30 credits total**	

Annual Progress Reports

Graduate students annually self-report on their progress in research, accomplishments of milestones towards degree (e.g. completion of Program of Study, Proposal Defense, or Comprehensive Exams), awards and honors received, and dissemination of results (papers published, presentations made). This annual progress report serves two important purposes. First, it allows the Program Coordinators and GAC to keep tabs on the progress of graduate students in the program and spot struggling students early. Second, it allows for better assessment of the programs in terms of student measures of success such as dissemination of research results. It is also recommended that this progress report be emailed by the student to all committee members each year.

An email is sent out each year with a link to a form that must be filled out no later than two weeks following receipt.

Failure to file a progress report annually is considered as lack of adequate progress towards degree. A letter will be sent to both student and faculty advisor and continued non-compliance will result in the student's file being reviewed by GAC to determine the consequences of this failure.

Ph.D. Dissertation Proposal Preparation and Defense

All graduate students in Biological Sciences, Environmental Toxicology, or Microbiology must prepare a written research proposal outlining the student's dissertation research project for discussion and approval by the Advisory Committee **by the end of the second year**. The proposal will be written in federal grant style (NIH, NSF, USDA, etc.). Please meet with your Faculty Advisor to discuss what format would be most ideal for your proposal. Once you have come to a decision, please inform your committee of the format of your proposal. **The proposal must be provided to the committee *at least* 14 days before the defense.** An email should be sent to the appropriate GPC stating that the proposal has been sent.

An oral seminar outlining the research plan will be presented in an open forum to the advisory committee members and the Department of Biological Sciences. See below for details on how to organize and publicize this seminar. Following the proposal seminar, the student will orally defend the proposed topic in a closed session with the Advisory Committee.

Upon successful defense by the student, the student and committee members will fill out and submit the GS-Research Approval Form (fillable form) to the grad school with a copy to the GSSC, biolgrad@clemson.edu. Students may be asked to revise their proposals and re-defend with the advisory committee, or enroll in more courses, if the committee feels such actions are warranted as a result of their first defense.

Reserve a Seminar Room

Contact Ms. Amanda Roberts (864-656-2328; aorr2@clemson.edu) at least four weeks in advance of the proposal defense date. Be sure to state that this is a **proposal defense** and not a final defense. Let her know the defense date, time, and room preference(s). She can also help choose a room. Some common rooms for public proposal defenses include the Jordan Room, Long 229, LSF 026, 142, and 242; BRC 100; and Poole E-142. Amanda can reserve the Jordan Room and the Long Hall rooms directly. She can fill out the forms to request LSF rooms or BRC rooms. She can also request Poole E-142, which has videoconferencing abilities, through Kate Price (kgthoma@clemson.edu). If Amanda is unavailable, email BiolSci@clemson.edu and someone will assist you.

A public proposal defense is required for all Ph.D. students.

Written Proposal

Provide the advisory committee with the proposal ***at least* 14 days** before the defense.

Announce Your Public Proposal Defense

At least 10 days before a public proposal defense, the student should email an announcement of the defense with the flyer attached (see below) to their Faculty Advisor, committee members, and the GSSC, biolgrad@clemson.edu.

The contents of the announcement should be **in the body of the email**. The contents include the student's name (the name of the person defending); what they are defending (Ph.D. dissertation); the title of the talk; the date, time, and location of the talk; and the Faculty Advisor's name.

The student should include this information on a flyer in a separate attachment with the email as well. The flyer should have the following format:

Title of Dissertation
(Title should be in 12 point Arial or Times New Roman font and centered)

Author's name

Ph.D. or M.S. Defense Advisor's name:

Names of committee members:

Date & Time

Location – zoom link or physical location. Information between here and title should be in 11-point Arial or Times New Roman font and centered.

The abstract, less than one page, if possible, should be included. The text of the above should be included in an email and as a separate PDF for distribution. Small photos and/or graphics can be included. A GOOD diagram (something that would, by itself, explain your proposed research to any interested persons) that can be used in place of a description of your research. An image related to your research (photo, graph, computer generated image, etc.) may also be provided.

Post the flyer on the Seminar Board near the main BioSci Office and on various boards in Long and Jordan Halls and the LSF, if appropriate.

Remote Proposal Defense

For any assistance with teleconferencing: Contact ithelp@clemson.edu for assistance.

To set up a virtual meeting, the Faculty Advisor should create the Zoom meeting with a waiting room, invite people in, and record the defense in the cloud. The waiting room, passwords and invites prevents random people from joining the Zoom room and interrupting the proposal defense. Clemson University provides excellent support for Zoom.

Graduate School policy permits proposal defenses to be delivered virtually if the defense is a synchronous event for the committee members. As this method is being employed more extensively than originally anticipated, the resources shared here are intended to support this process for all involved.

A link was forwarded to a post by Ashton Merck, who had a virtual dissertation defense and shared many excellent suggestions for both the defending student, as well as the faculty committee.

Use the GS-Research Approval Form

The GSSC will send the form through Adobe Sign on behalf of the student.

Once the form is completed and signed, it will be placed in the student's file and sent to the appropriate person at enrolled student services.

Ph.D. Comprehensive Exam

The comprehensive exam determines whether a student has the requisite knowledge and abilities to successfully pursue the Ph.D. degree and a career in science. Passing the comprehensive exam and filing the GS5D form with the Graduate School are requirements for Ph.D. candidacy.

The student is required to complete the comprehensive exam **at least six months before**

graduation after the start of the program. There are two formats of the exam that can be taken. A Ph.D. student will choose the format in consultation with their faculty advisor. The two formats are described in detail in below. Once a format has been selected, students should reach out to each of their committee members to determine what they expect from them.

According to the Graduate School, satisfactory completion of the comprehensive examination must occur no more than five years and at least six months prior to the date of graduation.

The committee will assess the knowledge of the student using a set of rubrics on a form (examples in Appendix VIII). The GSSC will send the form to the advisor after the comprehensive exam is completed and the advisor will submit the form with the committee's consensus evaluation after the comprehensive exams to the GSSC, biolgrad@clemson.edu.

Ph.D. Comprehensive Exam Formats

*Format 1***:** *"Research Proposal Format"*

This exercise is intended to ensure that the doctoral student who has successfully completed most of the coursework requirements can identify specific questions that remain unanswered in a research area and to develop a written research proposal that describes experimental approaches to answer these questions.

Note: The comprehensive exam research proposal should be on a topic that is not a part of the student's dissertation research or an ongoing research project of the student's mentor.

Choosing a Topic: The student and the advisor will discuss two or three topics of interest for a research proposal to be written in federal grant style. After discussion and agreement, the student will have two weeks to research the topics before presenting to the student's advisory committee. A 1.5 to 2-page description containing background and specific aims for each topic should be delivered to the members of the committee at least two days prior to an advisory committee meeting. At this meeting the student will give a short, informal presentation on each topic. The committee will decide which topic should be addressed in the research proposal and the student will have four weeks from the date of this meeting to write the proposal.

Format of Proposal: The proposal will be written in federal grant style. Sections will include background and significance, specific aims, and experimental design and methods. Students should contact their advisor to see which type of federal grant (NIH, NSF, USDA, etc) proposal formatting they would like. Students will not solicit help from any faculty or other graduate students when writing this proposal. The exam will be held two weeks after the submission of the research proposal.

Comprehensive Exam: Following submission of the research proposal to the advisory committee by the student, the committee will schedule the comprehensive examination. Here, the student will present, in 30 minutes or less, an overview of the research proposal and will then defend the proposal and answer questions from the advisory committee. The student will be expected to demonstrate a thorough knowledge of background information and apply basic information from their coursework and reading of the literature while answering questions about the research proposal. In addition, the student will be expected to demonstrate a general knowledge of

biology, physics, chemistry, biochemistry, mathematics, and the area of "bioscience" in which they are being trained. At the end of the exam, the committee can recommend Pass/Rewrite/Remediation/Fail.

- Pass: If a student passes, they should inform the GSSC. The GSSC will send out the GS5D through Adobe Sign to all the committee members. Once it has been signed, the GSSC will add the completed form to the student's file and send a copy to enrolled student services. Once the document has been approved by the Graduate School the student will be considered a **Ph.D. Candidate**. The student will then have a maximum of five years from this date to complete and successfully defend the dissertation research.
- Rewrite: The committee will decide the extent of the rewrite. They will communicate this information to the student and give them a deadline by which the rewrite must be completed.
- Remediation: The committee may decide that the student needs more background in a particular area, and they will therefore elect for remediation. The nature of this remediation is determined by committee. It can include, but is not limited to, additional course work or completing another comprehensive exam.
- Fail: If the advisory committee deems that the material and the student's preparation is of sufficiently poor quality to be considered a ""failure"", then several options may be recommended by the committee. These recommendations include but are not limited to, choice of another topic, a probationary period, or recommendation for dismissal from program. All the recommendations in this category will be presented to the Graduate Program Coordinator and the Graduate Advisory Committee, who will be responsible for determining the final status of the student. **For a student that is permitted a second attempt, a minimum of two months must pass before the student can undergo a second comprehensive exam**. A second failure of any part of the exam leads to an automatic dismissal of the student from the Ph.D. program.

Format 2: "Written and Oral Examination"

This format is the more traditional style where a student answers a series of written essay exam questions provided by each member of the advisory committee. Following completion of the written portion of the comprehensive exam, the student will then meet with the advisory committee for the oral portion of the comprehensive exam.

Written exam: The written examination should be constructed to evaluate: 1) the student's knowledge and appreciation of empirical and theoretical information from the specialty area and related subject areas, 2) the student's ability to analyze and evaluate such information, and 3) the student's ability to recognize and construct important and useful relationships of information from within and outside their areas of concern. For preparation, students should obtain a list of possible examination topics from each committee member prior to the examination. The length of the written exam and the rules for taking the exam (time limits, open versus closed book, etc.) are determined by each member of the advisory committee for their portion of the exam. Each committee member grades their own examination and reports the grade for each question, "Pass", "Marginal", or "Fail", to the major advisor. Upon receiving all results, the major advisor determines the outcome. If more than one of the written exams is marked "Fail" overall, then the

written portion of the exam is failed and must be re-done before the oral portion of the comprehensive exam can proceed.

Oral exam: The student schedules the oral exam no more than 3 weeks after receiving notification from their advisor that all written exams are passed. The oral exam should evaluate the ability of the student to think and speak in situations that require relatively rapid, well-organized, and articulate responses. The examination also provides an opportunity for the committee to further evaluate the student's knowledge and analytical abilities. At the end of the oral exam, the committee can recommend Pass/Rewrite/Remediation/Fail.

- Pass: If a student passes, they should inform the GSSC. The GSSC will send out the GS5D through Adobe sign to all the committee members. Once it has been signed, the GSSC will add the completed form to the student's file and send a copy to Enrolled Student Services. Once the document has been approved by the Graduate School the student will be considered a **Ph.D. Candidate**. The student will then have five years from this date to complete and successfully defend the dissertation research.
- Rewrite: The committee will decide the extent of the rewrite. They will communicate this information to the student and give them a deadline by which the rewrite must be completed.
- Remediation: The committee may decide that the student needs more background in a particular area, and they will therefore elect for remediation. The nature of this remediation is determined by committee. It can include, but is not limited to, additional course work or completing another comprehensive exam.
- Fail: If the advisory committee deems that the material and the student's preparation is of sufficiently poor quality to be considered a ""failure"", then several options may be recommended by the committee. These recommendations include but are not limited to, choice of another topic, a probationary period, or recommendation for dismissal from program. All the recommendations in this category will be presented to the Graduate Program Coordinator and the Graduate Advisory Committee, who will be responsible for determining the final status of the student. **For a student that is permitted a second attempt, a minimum of two months must pass before the student can undergo a second comprehensive exam.** A second failure of any part of the exam leads to an automatic dismissal of the student from the Ph.D. program.

Ph.D. Research and Dissertation Defense

The emphasis of the doctoral program is research, and time spent in research will increase each year. A student will choose a project in consultation with their advisory committee that, upon completion, will merit the awarding of the doctoral degree. **The research should be an original contribution to the student's field of choice and should result in at least one publication in a quality, peer-reviewed journal prior to the defense.** The student is expected to devote a considerable amount of time to research, even while completing coursework and teaching as time management will be crucial in all their future work.

The dissertation *must* be provided to the committee **at least 14 days before the defense**. An email should be sent to the appropriate GPC stating that the dissertation has been sent. The

defense must also occur **at least one full week (seven days)** before the final manuscript is due to the Graduate School. Please see the information below on how to schedule your final defense.

The defense will include a public departmental seminar in which the student presents the results of their research and followed by a "closed-door" oral defense of the research with the advisory committee. This final Oral Exam may consist of general questions covering the discipline and mastery of skills and questions challenging the dissertation. Students should prepare for the general questions through review of their classwork, and by remaining current in the literature related to their field of study. The defense of the dissertation will focus on the hypotheses, methods, results, and conclusions in the thesis, so the students should be thoroughly conversant with all aspects of the research.

Procedure for Organizing Your Dissertation Defense

The following outlines the steps in scheduling the defense, advertising the defense, filing the appropriate form with the Graduate School once the defense has successfully been completed, and filing the appropriate assessment form with the Department. Students should go here for all deadlines *well in advance* of the semester they intend to defend. Note that students must be enrolled for at least one credit during the semester they plan to defend (usually BIOL/ETOX/MICR 9910 but can be anything) and that they have to apply for graduation (GS4) at the beginning of the semester in which they plan to defend.

If a student can complete all their requirements, including an accepted manuscript, before classes begin in the coming semester, they will be cleared to graduate at the end of that semester without having to enroll in credit hours or pay tuition. Check with enrolled student services for the exact deadline for each semester. Students should notify them if their plans to graduate are delayed.

Note: Ph.D. candidates must pass the oral examination, i.e. the dissertation defense, at least three weeks prior to the commencement ceremony.

Reserve a Seminar Room

Please see the Reserve a Seminar Room section under "**Ph.D. Dissertation Proposal Preparation and Defense"** for directions. When contating reach out to Teri, please make sure to specify that this is the **final defense**.

Announce Your Defense

Please see the Announce Your Defense section under "**Ph.D. Dissertation Proposal Preparation and Defense"** for directions.

Remote Dissertation Support

Please see the Remote Dissertation Support section under **"Ph.D. Dissertation Proposal Preparation and Defense"** for directions.

Use the GS7D form and Dissertation Rubrics

A successful "Pass" of the defense will result in filing the GS7D form with the Graduate School.

The GSSC will send the GS7D form through Adobe Sign to all the committee members for approval. Once it has been signed, the GSSC will add the completed form to the student's file and send a copy to enrolled student services.

The committee will assess the student for departmental assessment purposes using a set of rubrics on a form (examples in Appendix VIII-X). The GSSC will send the form to the advisor after the comprehensive exam is completed and the advisor will submit the form with the committee's consensus evaluation after the final defense to the GSSC, biolgrad@clemson.edu.

Guide for Formatting and Submitting of Your Dissertation

The Graduate School requires that all Doctoral dissertations be submitted in electronic format. Guidelines for electronic format of dissertations can be found on the Graduate School webpage. The official copy of your dissertation must be submitted to the Graduate School in this electronic format and approved before your degree will be awarded.

In addition to the electronic copy of the dissertation document required by the Graduate School, a student has the option to purchase bound copies through a vendor. A signature page from the advisory committee (not available in the electronic copy) can be included in the bound copy, and there is an option to print your figures in color. Please visit this page for more information.

Graduation Guidelines

The semester that the student intends to graduate, there are a list of procedures the student must do by specific deadlines to graduate on time. The list of these deadlines can be found here: Graduation Deadlines | Graduate School (clemson.edu), and there is more information about them below.

Comprehensive Exams: Comprehensive exams need to be finished at least **six months** before the graduation date. So, students should aim to complete them by the beginning of the semester that comes before the semester they intend to graduate.

Final GS2 Form: Towards the beginning of the semester that the student graduates, the student may need to resubmit their GS2 form. This only needs to be done if the core courses that count toward the degree have changed since the original version was submitted. If a course has changed, but it is not one of the ones strictly required for graduation, the form does not need to be resubmitted. Students that submit this form after the deadline will be charged money, so be sure to check the deadline.

Apply to Graduate: At the beginning of the semester that the student intends to graduate, they will need to formally apply to graduate through iROAR. To do this, access the iROAR page. Select "Student Record." Then, select "Apply to graduate." If questions arise during this process, please reach out to enrolled student services at essrecs@clemson.edu.

Schedule your Defense: Reach out to Amanda Roberts (see directions above) at least four weeks in advance of the defense to reserve a room. Then, 10 days before the defense, the student will need to inform the GSSC about their defense by emailing them the flyer to biolgrad@clemson.edu. Finally, they need to submit the date, time, and location of your defense to the Graduate School

by submitting the "Submit Defense Form", which can be found here: Submit Defense Form | Graduate School (clemson.edu).

File your GS7D: The GS7D needs to be submitted to enrolled student services at least one week before your completed dissertation is due. The GSSC will send the GS7D form through Adobe Sign to all the committee members for approval. Once it has been signed, the GSSC will add the completed form to the student's file and send a copy to enrolled student services.

Submit your Completed Dissertation: Once the committee has agreed on the final version of the dissertation, it will need to be submitted to the Manuscript Review Office (Submit Your Thesis/Dissertation). This needs to be done at least **three weeks** before graduation.

Submit your Revised, Final Thesis: The Manuscript Review Office may have minor edits for the formatting of the manuscript. They will email these edits in one to two business days. The student will have one week from the initial submission to turn in the final, edited manuscript.

Doctoral Hooding Ceremony: The doctoral hooding ceremony is normally held in the Brooks Center for the Performing Arts. The schedule for the commencement ceremony for students can be found here: Graduation Ceremony Schedules | Clemson University, South Carolina. All doctoral students who apply for graduation will receive an email closer to the ceremony date asking them to confirm their attendance and provide further information via a registration link. This email will be delivered approximately one month before the ceremony date. Regalia needs to be ordered in advance, at least one month before commencement, and is done through the Clemson University Barnes & Noble Bookstore to determine that.

Ph.D. Student Financial Support / Tuition / Fees

Teaching and Research Assistantships

Graduate students accepted into the Biological Sciences, Environmental Toxicology or Microbiology graduate programs are either awarded support through the Department of Biological Sciences as Graduate Teaching Assistants (GTAs) or from individual faculty advisors' sponsored grant funds as Graduate Research Assistants (GRAs). A student may be both a GTA and a GRA during their time at Clemson depending on their faculty advisor's grant funding. Students can work a maximum of 28 hours a week if they are a U.S. citizen and 20 hours a week if they are an international student.

To be eligible for a GTA or GRA, a student must be enrolled full-time. Full-time status entails registering for a minimum of nine credit hours during the fall and spring semesters. If a student's assistantship continues into the summer, then the student must be enrolled in three credit hours in each summer session or six credit hours in the long summer session. A GTA/GRA can be terminated at any time for substandard, unsatisfactory, or unethical performance. The annual progress report letter sent by GAC each August identifies problems with performance or progress toward the degree and sets deadlines for resolving the problems (see the annual progress report section above for more details).

GTAs are awarded upon acceptance to the program and may be renewed annually based upon performance in teaching and satisfactory progress towards degree for up to five years (10 semesters). The current rate for a 9-month appointment (not teaching in the summer) is $24,000 for Ph.D. students before they pass the Comprehensive Exam. Ph.D. students who have successfully passed the Comprehensive Exams and submitted the GS5 form to the Graduate School will receive a 9-month rate of at least $26,000 per year, starting after the form is filed, and the change of pay can be processed (the start of the next pay period). Annual GTA stipends may be supplemented by Faculty Advisors' grant funds or from other sources. Additional GTA support may be available with satisfactory research progress towards the degree and permission from the GAC and department chair.

GRAs are awarded by individual Faculty Advisors with funds available from research grants. Individual stipend amounts and conditions of renewal are determined by individual Faculty Advisors, but currently funded GRA stipends of at least $24,000. This will depend on the tenure of the student (years in program) and availability of supplemental funds. GRA support is negotiated by prospective students with individual Faculty Advisors.

All Ph.D. students are given a $3,000 stipend for their first summer. **Summer funding is not guaranteed after that first summer, so students should be sure to save money during the fall and spring semesters to support themselves over the summer semester.** During the summer months, graduate students may be employed on an assistantship or on an hourly basis. Graduate students on an assistantship in the summer must enroll in at least three credits for each of the two summer sessions. Graduate students employed on an hourly basis do not need to register for courses over the summer.

A limited number of university fellowships are available on a competitive basis by nomination. The GAC will inform students of these opportunities. We also encourage graduate students submit proposals for outside funding, such as an NSF GRFP.

The department currently offers one or two competitive spring semester Professional Development GRAs to Ph.D. students finishing their dissertations within 18 months. The stipends are at the same rate as a GTA and come with $2,000 incentive supplement and full tuition coverage for one semester. These awards are based on the student's past and current plans for professional development and research success. The $2,000 incentive funds are for professional development opportunities only. Applications for these professional development awards will be solicited in the Fall semester.

The department (through the university) also currently offers two competitive Interdisciplinary Fellowships to Ph.D. students whose research is interdisciplinary. These supplementary awards to the graduate student stipend will be solicited in the spring or summer and awarded the following academic year. Other fellowships/awards are listed below in the table and are solicited in the spring and awarded the following academic year. The student can apply with one cover letter for all eligible fellowships, but they need to state in the cover letter which fellowship(s) they are applying for and explain why they are eligible to apply.

Fellowship name	Target applicants and eligibility
Alex P. Anderson and Lydia Anderson Fellowship	Graduate students conducting advanced research in biological sciences (including bacteriology and entomology). NOTE: The student must already hold a Clemson University degree at any level.
Dr. Harry Findley (’71) and Catherine T. Findley Student Assistance Endowment	Graduate students studying microbiology or biology within the Department of Biological Sciences in the College of Science.
J. Michael & Ellen Dobson Henson Student Assistance Endowment in Microbiology	Graduate students majoring in the Microbiology Ph.D. program and performing research in the areas of microbial ecology, geomicrobiology, environmental microbiology, food microbiology, or other microbiology program areas.
Dr. Stephen Klaine Annual Memorial Fellowship	Graduate students who are enrolled in Environmental Toxicology Ph.D. program.
Dr. David W. Tonkyn Memorial Annual Fellowship	Fellowship for graduate student enrolled in Biological Sciences that is studying conservation and/or endangered species.

Ph.D. Program Timetable

Requirement	Relevant Form	Deadline (deadline for students entering Fall 2025)
Advisory Committee Selection	Online, GS2	By end of Semester 3 (December 2026)
Plan of Study	Online, GS2	By end of Semester 3 (December 2026)
Dissertation Proposal and Defense	GS-Research Approval	By end of Year 2 (July 2027)
Comprehensive Exam	GS5D , Rubric	By end of Year 3 (July 2028)
Dissertation Submission / Defense	GS7D , Rubric	No more than 5 years after filing GS5
Annual Progress Report (APR)	APR	Every year
Research Presentation	APR	Every year
Seminar Attendance (BIOL 8120/ETOX 8610)	APR	Must be enrolled up to 6 credits at CU. Recommended attendance otherwise.
Reading Group Attendance (BIOL 8070/MICR 8070)	APR	Must be enrolled up to 6 credits at CU. Suggested attendance otherwise.

APR = Annual Progress Report

IV. M.S. *EN* ROUTE TO A PH.D. PROGRAM

Clemson has adopted a process by which a doctoral student *may* be granted a master's degree in their same discipline while progressing towards a doctoral degree. This process is called the '*en route*' master's to distinguish it from the 'normal' master's degree for students who matriculated into master's degree programs. The '*en route*' process is neither automatic nor mandatory; however, there is no difference in requirements for either the M.S. or an '*en route*' M.S. degree.

The *en route* M.S. is not an avenue for students who seek only a M.S. degree and who do not plan to pursue the Ph.D. degree. The *en route* M.S. provides greater flexibility for students in case they elect to pursue a Ph.D. in another program or at another institution after fulfilling the requirements for the M.S. degree.

Students must be enrolled as a Ph.D. student to utilize this mechanism. To change to a M.S. *en route* program, a Graduate School Form (GS2-14) should be submitted to document 1) the fulfillment of requirements for an *en route* M.S. degree and 2) the faculty's recommendation to award the *en route* M.S. degree. Normal university deadlines apply in all cases.

The M.S. *en route* program is used primarily for students in good academic standing, that achieved a good amount of progress on their research, that have already passed their comprehensive exams, that have enough credit hours to receive a master's degree, and that have satisfied all the requirements for the master's degree while maintaining a GPA of at least 3.0.

At the discretion of your advisory committee, six hours of course work may be double counted towards both the master's and doctoral degree credit hour requirements. This will result in 30 hours for the master's degree and 24 unique credit hours for the doctoral degree.

The student will take and pass the M.S. oral exam (at the M.S. thesis defense) before being awarded the '*en route*' M.S.

Program Guidelines

Students who enter the M.S. *en route* to Ph.D. program in the Department of Biological Sciences will be considered M.S. students until defense of the thesis. After a successful defense, they will be considered doctoral students. **It is important to note that per Graduate School policy, the time limit to degree does not start over after a student completes the M.S. *en route* if they return to the doctoral program in which they were originally admitted into.** Students who complete the M.S. *en route* will have eight years to complete both degrees, beginning from the term they first matriculated in the doctoral program.

Students who wish to obtain the M.S. *en route* to their Ph.D. must take and pass the oral exam at the master's thesis defense before award of the M.S.

During the M.S. portion of the program, the guidelines and regulations of the standard departmental master's Program apply including required coursework for the M.S. degree.

V. M.S. BYPASS TO A PH.D. PROGRAM

Students admitted and enrolled in the M.S. program can bypass the M.S. degree and proceed directly to the Ph.D. upon petition to GAC. The M.S. bypass is intended for students whose research has expanded to the point that a Ph.D. degree is more appropriate. M.S. bypass requests should typically be submitted *in the third semester* of the M.S. program. **Students who use this option are not awarded the M.S. degree.**

The following procedure must be followed if a student wishes to bypass the M.S. degree:

1. The student must have successfully completed at least two semesters of academic work in the M.S. program, accumulating a minimum of six credit hours of BIOL/ETOX/MICR coursework at the 8000 level plus three credit hours of thesis research (BIOL/ETOX/MICR 8910) while maintaining a minimum GPA of 3.0. The student must also have met the M.S. program's requirements pertaining to enrollment in Seminar and Reading Groups and have made significant progress toward their research goals. The student should also have formed a committee of at least four eligible faculty (see Ph.D. Dissertation Advisory Committee Selection), met with their committee, and submitted a Plan of Study for the M.S. degree.
2. Following discussions between the student and their advisory committee, the student will submit a short (1-2 pages) written request to GAC to bypass the M.S. degree. This request should outline the student's progress in the M.S. program and must justify why a bypass is appropriate. Supplementary materials, such as a CV, reprints of published papers or published abstracts, completed unpublished manuscripts, or a list of formal presentations, can be included with the request. The advisor should also submit a letter to the GAC, written in consultation with the student's advisory committee, supporting the student's request.
3. GAC will either approve or disapprove the initial request. In the case of initial approval, GAC will provide a one semester extension of the M.S. (potentially Ph.D.) proposal defense, which is normally due by the end of the third semester.
4. The student will then write their research proposal as if it were for a Ph.D. and present a Ph.D. proposal defense seminar open to the department within eight weeks of the beginning of the fourth semester. At least two members of GAC, apart from any members of the student's advisory committee, will attend the proposal defense. In the seminar, the student must present evidence of significant research progress, outline a specific research plan for the Ph.D., and demonstrate sufficient communication skills. The student will then meet in a closed-door session with their advisory committee to defend their proposal.
5. Following the seminar presentation, the student's advisory committee will submit a written recommendation to GAC as to whether the student is prepared to move directly to a Ph.D. A final decision of the application to bypass the M.S. degree will then be made by GAC.
6. If the request is not approved, the earliest a M.S. student could defend their thesis is the following semester because of the dates for applying for graduation.
7. If the student is approved to switch to the Ph.D., the Lead Graduate Programs Coordinator will notify the Graduate School and a GS14 form will be submitted. A new faculty advisory committee must be selected to meet the requirement of a minimum of four advisory

committee members for Ph.D. students, and the Plan of Study must be re-filed reflecting the student's new status in the Ph.D. program. Students admitted to the Ph.D. program in this way are expected to fulfill all current Ph.D. requirements.

Appendix I: Additional Information about Grad School and the Department

A. New Student Hiring Directions

1. All new graduate assistants to be hired by the Department of Biological Sciences will be contacted by the Administrative Coordinator, Amanda Queen to begin the new hire process. All forms and instructions will be included. Items to be completed consist of:
    a. New Employee Data Sheet: A fillable form that must be completed as part of the hiring process.
    b. I9: Completing an I-9 form is a federal requirement and provides proof of authorization to work in the United States. The I-9 document contains a list of acceptable documents. From that list students will need to present either one official document from list A OR 1 from list B + list C.
        - **U.S. citizens:** Instructions will include how the student can provide your documents for verification, providing alternatives to in-person meetings if needed.
        - **International students:** A meeting with the International Employment division in Human Resources is required. Please contact biolgrad@clemson.edu for details on all steps.
2. HR and Payroll also asks that each student supply a copy of their social security card. The Social Security Administration requires employers to enter all employee names into the payroll system as it appears on the employee's social security card.
3. Once the employment record is entered into the HR/Payroll database, the student will be notified by email with instructions for setting up direct deposit for their pay, their tax withholding, viewing their pay stub, and signing up to receive their W-2 tax form online (if desired).

B. Reporting Hours Worked

Fall and Spring

To comply with the Affordable Care Act (ACA), we must obtain, and report paid service hours accurately and in a timely manner. Therefore, all graduate assistants, whether they are a teaching assistant or a research assistant, must accurately report paid service hours worked in a timely manner. The University uses a program called Time Capture to log all these hours. Directions on how to use this program are below.

1. Log in to the https://hr.app.clemson.edu/tcs/.
2. Enter Clemson ID and password.
3. Enter paid service hours or check the box to certify you did not work that week.
4. Click submit.

Action(s) taken for missed entries:

The Office of Human Resources will send a reminder each month regarding required entries.

Missed entries after the deadline may result in disciplinary action (reference the guidelines for specifics) for those weeks being calculated based on full-time work hours for the purposes of the ACA.

Summer

If at any time, a student works **as** a **Graduate Student Hourly or Graduate Student Summer Employee,** they will have to **enter** their **hours in Kronos.** Directions on how to do this are below.

1. Click on the link to visit Kronos, Kronos Workforce Central(R) (works best in Chrome)
2. Log in using the appropriate Clemson credentials.
3. Find the current date and "punch in" for the start time and "punch out" at the end of the day.
4. On the 1st and 16th of every month, student will need to approve their timecard for hours worked the previous 15 days.
5. To approve timecard, chose "previous pay period" on the top right side of the timecard. Review the hours and click approve timecard in the top left corner.

Training videos for Kronos can be viewed here.

C. Payroll, Fees, and Benefits Information

Payroll

Graduate teaching (GTAs) and research (GRAs) assistants receive semimonthly payments throughout the year. Most appointments are 9-month annual appointments beginning around August 15th of each year to around May 15th. They will receive nine semi-monthly payments for Fall, and nine semi-monthly payments for Spring. Paydays are the 15th of the month and the last day of the month unless the date falls on a weekend or holiday. Paychecks must be directly deposited into a checking or savings account.

Directions for initiating your direct deposit can be found at: https://www.clemson.edu/human-resources/payroll/direct-deposit.html. It is possible to direct deposit in up to five different accounts. Students who have questions/problems with their payroll should contact the GSSC, biolgrad@clemson.edu.

Fees

Each semester, there are various fees that each student must pay that include access to the health center, gymnasium (Fike), and software. For 2025-26, the amount is $919/semester for students on an assistantship; check here to calculate the most up to date amount. Health insurance is not included in these fees and must be purchased separately (see below). Students who have insurance through a relative must submit a waiver.

Fees can be drafted from a bank account in six consecutive installments each semester, except for the first semester a student is enrolled. The fees will be withdrawn every two weeks. Most graduate students will be on an assistantship and therefore the relevant section of that site is found under "Full-Time Graduate Tuition and Fees".

Health Benefits

Clemson University requires all full-time (nine hours or more), on-campus graduate students to have health insurance coverage. It may be purchased through Clemson University or though other insurance policies that meet the University requirements. The Graduate School subsidizes the cost of health insurance. See this site for more information about the insurance, please visit their website. If you have any questions about health and medical insurance, contact Redfern Health Center (RedfernInsBilling@clemson.edu or 864-656- 3561).

D. Graduate Student Organizations

Biological Sciences Graduate Student Association (BSGSA)

The Biological Sciences Graduate Student Association (BSGSA), organized by the departmental graduate students, sponsors a speaker each year, organizes various social events, provides travel awards, helps recruit new graduate students, and assists with departmental functions as requested. The BSGSA also serves as a liaison between graduate students and the Department. More information about BSGSA can be found on their website.

The BSGSA offers Travel Awards, on a competitive basis, of up to $400 each to active member. Application forms and instructions can be obtained from a BSGSA officer. The current BSGSA officer roster can be obtained from the GSSC (biolgrad@clemson.edu) or on their website.

Environmental Toxicology Graduate Group Association (ETGGA)

The Environmental Toxicology graduate program was established at Clemson University in 1992, offering both M.S. and Ph.D. degree programs. The Environmental Toxicology Graduate Group Association (ETGGA) is an organization is dedicated to serving the graduate students within EnTox, providing a social outlet, performing community outreach, and providing a resource for professional/academic information and opportunities. The current BSGSA officer roster can be obtained from the GSSC (biolgrad@clemson.edu).

University Graduate Student Government (GSG)

The goals of GSG are to:

1) Increase graduate student involvement
2) Act as a liaison between the University and graduate students
3) Act as a channel for graduate students to collaborate and enhance their education
4) Provide opportunities for graduate students to develop professionally and academically

If you are interested in learning more about GSG you can find more information on their website.

The GSG offers travel awards of up to $750 (domestic) and $1000 (international), each on a competitive basis during fall, spring, and summer semesters. Specific award details and instructions are subject to change. More information about the Graduate Travel Grant Service is found here.

E. Computing

Computing Services
The University's Center for Computing and Information Technology (CCIT) is responsible for all computing issues on campus. New students are assigned a user ID and a temporary password upon admission to the University. CCIT maintains several computer labs throughout campus that are open to students. Wireless access is also available in many buildings throughout campus.

Students can have personal computers set up with appropriate software and wireless setup by taking the computer to the CCIT help desk (Second Floor of Cooper Library) or emailing ithelp@clemson.edu to set up an appointment.

Poster printing
Poster printing is handled through CCIT and students have access through their website. All graduate students get $25.50 in their account per semester (Spring, Summer, Fall) that does not roll over between semesters. A student can add to this balance at https://t1online.app.clemson.edu/deposit/tigerstripe.

Digital File Storage
The department has a Box folder that holds files of interest for graduate students. This includes all the forms and rubrics needed for the plan of study, as well as the thesis/dissertation defense. It also has information about fellowships, safety trainings, seminar presentations and more. The GSSC will invite all new students to be able to access the Graduate Student Resources Box folder upon their arrival at Clemson.

F. Office Information

Graduate students are sometimes assigned a desk in research labs located in Jordan Hall. However, desks and filing cabinet space are also available in the graduate student office in 230/234 Long Hall. Contact Amanda Roberts (aorr2@clemson.edu) for assistance if you need a desk in this room. Students whose labs are in the Life Sciences Facility (LSF) are assigned desks in a common graduate student office in that facility. Ask your advisor and contact Rick Moseley (remosel@clemson.edu) for assistance.

Mail
Graduate student mail should be addressed as follows:

Your Name, Department of Biological Sciences
132 Long Hall, Clemson University
Clemson, SC 29634-0314

Outgoing mail can be placed in the appropriate bin in 133 Long Hall. All personal U.S. mail must be stamped.

Building Access
All buildings on campus can be accessed with the TigerOne Card. Please see this website,

TigerOne ID Services (clemson.edu), for information on how to obtain a card. To gain access, a student's advisor must request access, via email, to the correct Building Manager.

Long Hall: Charles Allen (impala@clemson.edu)
Jordan Hall: Weston Link (weston1@clemson.edu),
Life Sciences Facilities: Rick Moseley (remosel@clemson.edu).

Keys for access to laboratories and offices, in Long Hall and Jordan Hall, are assigned through the BioSci main office. Please see Amanda Roberts in 132 Long Hall. Keys to specific laboratories require the approval of the laboratory principal investigator. Contact the instructor or course coordinator to acquire keys to specific teaching laboratories. Keys to conference rooms and classrooms can be signed out from the departmental office as needed on a limited basis. The student is responsible for all keys given to them and for ensuring that all areas used by them are locked when they leave. Please return keys when they are no longer needed.

Office Materials
Office materials (including printer paper) are available for class or research use through the appropriate teaching or research professor. See the main departmental office (Long 132) to obtain these materials.

Photocopies
Photocopy machines are in 135 and 149 Long Hall. Personal copying may not be done on the departmental copier. Ms. Amanda Roberts can show any student how to scan, print, and copy from these machines. Copiers are available in the library and at commercial sites downtown (e.g., Copy Shop, 189 Old Greenville Hwy Suite A., Clemson, SC.) for personal copying.

Sending Express Shipments
To send an express package, a student should contact their advisor/lab manager. The student must provide an account number to pay for the shipment (available from their faculty advisor). They will need specific training offered by the Occupational and Environmental Safety Department to ship biohazard materials or with dry ice.

Departmental Vehicles
The department maintains three trucks, three 18-passenger vans and three golf carts for departmental teaching and research use. A student must be a licensed driver and complete an online driver training course offered through Clemson to drive a SC State vehicle.
Please contact biolsci@clemson.edu to register for the online driver training course. Be sure to be aware of all state regulations regarding the use of vehicles. Any ticket a student receives will be theirr responsibility whether on campus or on the road. To reserve a departmental vehicle, contact Ms. Amanda Roberts (aorr2@clemson.edu) in the departmental office.

G. Transportation and Parking

All CAT buses are free. They have campus routes as well as routes servicing Clemson, Central, and other surrounding areas. For information and routes visit CAT.

Commuter student parking is in the orange spaces and by permit only. Information and permits

can be obtained from Parking Services in the University Union.

H. Facilities

Departmental Facilities

Research and teaching for the Department of Biological Sciences takes place primarily in Long and Jordan Halls and the Life Sciences Facility (LSF). Information about the resources in these facilities can be found below.

Laboratories. No smoking, eating, or drinking is allowed in either the teaching or research laboratories. All personnel working in labs with hazardous chemicals must have all skin areas covered; lab coats are required; sandals are not allowed. Laboratories, both teaching and research are to be kept clean and in order.

Teaching Laboratories. Undergraduate students may not be left in teaching laboratories without supervision. Building and equipment security is your responsibility. Be sure doors and windows are closed and locked following lab. Do not leave building doors propped open after hours for any reason.

Common Departmental Equipment. Students should not use common equipment until they have been trained to do so. Sterilization (autoclaves) and glass-washing facilities, walk-in cold rooms and environmental chambers are available on each floor in Jordan and in many locations in the Life Sciences Facility. Students should receive training in operating this equipment from either the course coordinator (teaching labs) or their research advisor prior to use.

Microscopy, Imaging, *Flow Cytometry.* The Light Imaging Facility is located Suite 030 of the Life Sciences Facility. Information regarding the use of this equipment can be obtained by emailing imaging@clemson.edu. See their website for more details.

University Facilities

Specialized fee-based campus facilities are also available to all departmental researchers. These include animal facilities, green house facilities, imaging facilities, a DNA sequencing facility, and genomics/proteomics capabilities. A description and contact information for major resources is found below.

Advanced Materials Research Laboratory (Research Park – AMRL). Additional electron microscopy facilities are available at AMRL. Equipment at this center includes SEM, TEM, STEM and FESEM capabilities. More information can be found on their website or by contacting Dr. Lax Saraf (lsaraf@clemson.edu).

Clemson University Genomics and Bioinformatics Facility (CUGBF). This facility offers sequencing, ddPCR, nucleic acid quantification and bioinformatics support. The Director is Dr. Christopher Parkinson (viper@clemson.edu).

South Carolina Botanical Gardens. The South Carolina Botanical Gardens has field areas (old fields, woods, a small stream, etc.) on a 295-acre site for programmatic use.

Clemson Experimental Forest. The Clemson Experimental Forest's 17,500 acres are dedicated to education, research, and demonstration to better understand and manage forest resources for the benefit of society. With approval, the Experimental Forest may be available for research and teaching purposes (contact Harold Odom, Interim Forest Manager, hodom@clemson.edu, 864-360-4253).

University Greenhouses. Greenhouse space is available for research purposes. The department operates greenhouses on the roof of Jordan Hall and rented space in the Biosystems Research Center (BRC) greenhouse facility. Dr. Matt Koski (mkoski@clemson.edu) oversees the teaching collection in the greenhouses. See their website for information about the BRC greenhouse, which has space to rent for research purposes.

Bob and Betsy Campbell Museum of Natural History. The vertebrate collection is in the Bob and Betsy Campbell Museum of Natural History. The collection is available for use in teaching and research. Contact Ms. Melissa Fuentes (fuente2@clemson.edu, 864-656-2328), curator, for questions regarding the museum or its collections.

Herbarium. The Herbarium is located in the basement of Long Hall. The department maintains an excellent collection of local, regional, and worldwide floras. All qualified graduate students are invited to utilize the herbarium. Dr. Lorena Endara (cendara@clemson.edu, 864-656-7234) is the curator in charge of the herbarium.

Aquatic Animal Research Facility. Located in P&A, Room 26 and the adjacent corridors. Rooms are available for short- term projects involving aquatic animals housed in aquaria, stock tanks, and raceway channels. Re-circulating tanks and raceways can be used for freshwater or sea water research projects. Requests for research space in this facility should be made by your faculty advisor. Please visit their website for additional information.

Godley Snell Animal Research Facility. GSRC is managed by the Office of Research Services and provides centralized laboratory animal facilities, equipment, caging, and veterinary and technical support to facilitate diverse campus-wide animal research and teaching programs. Services available include: Animal Procurement and Maintenance, Animal Care and Health Surveillance, Project Cost Analysis, Project Development and Veterinary Consultation, Technical Services (blood collection, veterinary care, euthanasia, and sample collection), and Surgical Services. Please visit their website for additional information.

Other department personnel who may be of assistance are listed in Appendix IV.

I. Safety Manuals and Training

For more information about safety and training, please see Appendix XIII.

J. Travel Forms

The system that Clemson uses to reimburse students for travel, or any other expenses is Concur. Students will need to save their receipts for all expenses and submit them through the Concur

program no more than one week after the expense occurred. For more information about how to log in to Concur and how to use it, please access the graduate student resources folder in Box (https://clemson.app.box.com/folder/189450468882). Before submitting a reimbursement request for the first time, please reach out to our Account Payable and Receivable Accountant (Tonya McManus, tmcmanu@clemson.edu) to set up a time to go over how to set up an account, how to use Concur, and how to add her as an expense delegate. If it is not the student's first time submitting a reimbursement request, and they have questions, they should reach out to the GSSC at biolgrad@clemson.edu. Anytime you submit a reimbursement request, the student should also reach out to our financial analyst (Chris Krouchick, Jr, ckrouch@clemson.edu) to ensure that they are using the right account number for the reimbursement.

Appendix II. Graduate School Forms Summary

This section briefly outlines the forms that are required by the graduate program for both Ph.D. and M.S. students. Each form can be found on the Graduate School website and these should be used as some forms are now online or accessible through iROAR. Completed original forms are submitted to the Graduate Enrolled Services Office (104-D Sikes Hall) electronically and copies are kept by the BioSci Department. You will need to send a copy to the GSSC, biolgrad@clemson.edu.

It is the student's responsibility to check the Graduate School website to ensure the most recent update of the form is used for submission.

Plan of Study. The Plan of Study (formerly submitted as the GS2 form) is to be determined in consultation with your faculty advisor and graduate committee and is submitted through iROAR. It details the coursework to be completed as part of the graduate program. All courses listed in the Plan of Study must be passed with a grade of "B" or higher prior to completion of the graduate degree, even if those courses are not part of the general degree requirements.

GS-Research Approval From (here) Please submit and send a copy to biolgrad@clemson.edu after your proposal defense.

Results of the Comprehensive Ph.D. Exam Form (GS5D; Ph.D. Only). This form is to be completed by the graduate committee upon completion of the Ph.D. comprehensive exam. Please submit and send a copy to biolgrad@clemson.edu.

Application for Graduation and Diploma Form (GS4). This form must be filled out and turned in through iROAR several months prior to graduation (check online for deadlines relative to your graduation date). This form officially informs the Graduate School of your intention to graduate and must be re-submitted if your graduation date is postponed.

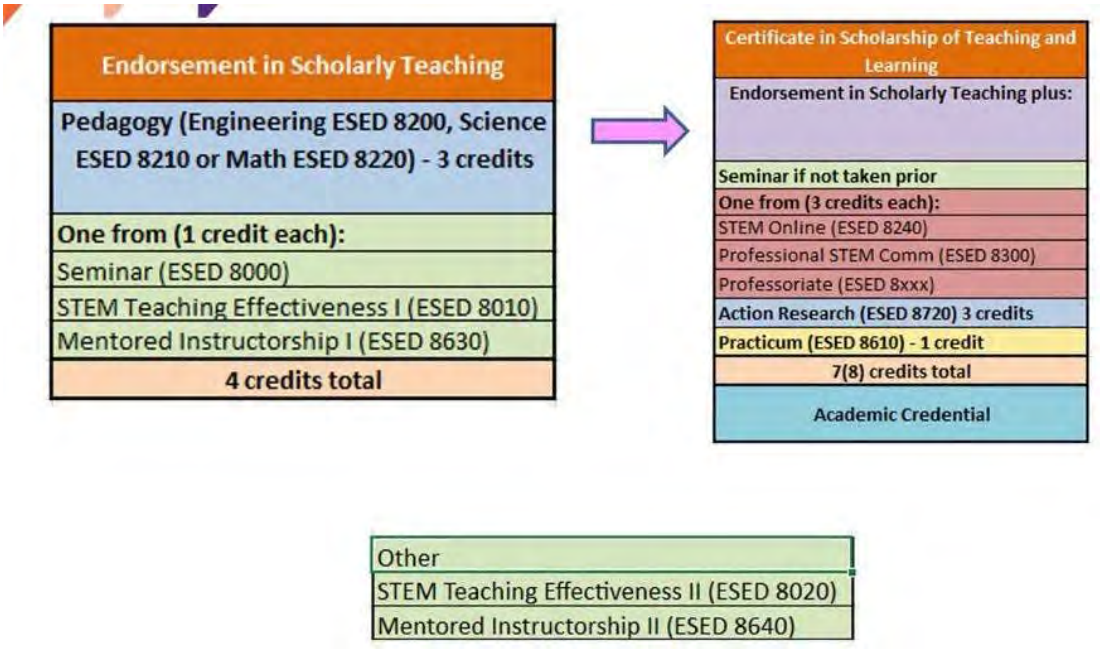
M.S. Final Exam and Thesis Approval Form (GS7M). This form is completed following the final M.S. thesis defense. It is a record that your thesis has been reviewed and signed by your advisor. It is turned in when your thesis is turned in for review by the Graduate School. Please send a copy to biolgrad@clemson.edu.

Ph.D. Dissertation Defense and Dissertation Approval Form (GS7D). This form is completed following your dissertation defense and acceptance of your Ph.D. dissertation by your committee. Once it is signed by your advisor, you will turn it in for review by the Graduate School. Please send a copy to biolgrad@clemson.edu.

Clemson University Name Change Request (Name Change Request). This form is turned in to officially change your legal name in the school records (such as in the case of marriage or divorce).

Appendix III. ESED Program

Credits in STEM education can be taken from ESED (Engineering and Science Education) to improve your teaching and consider new teaching methods. These classes can be taken as part of an Endorsement or Certificate Program and may be a good idea for students interested in teaching or lecturing at small colleges and universities or working as a lecturer at larger universities. It is also suggested for students that are considering working at larger state universities or at RI or RII institutions in which teaching is a significant component of their duties. The pdf flyer can be found here.



Department of BIOLOGICAL SCIENCES
Clemson University

Appendix IV. Rubric for Assessing Student Learning Outcomes
Biological Sciences – MS Thesis and Defense

Student Name:
Defense Date:
Advisor Name:

SLO 1: Knowledge of principles and theories in biology as demonstrated in the thesis defense:

Demonstrates adequate knowledge of general principles and theories in biology	Select one:
Demonstrates adequate knowledge of particular subdiscipline of study	Select one:

SLO 2: Application of scientific methods in biology as evidenced by the written thesis:

States the research problem clearly, providing motivation for undertaking the research	Select one:
Demonstrates sound knowledge of literature in the area, and of prior work on the specific research problem	Select one:
Shows a good understanding of how to use methods/tools effectively	Select one:
Defends use of particular methods/tools clearly and logically	Select one:

SLO 3: Effective oral communication of research in biology as evidenced by the thesis presentation:

Provides sufficient background information to justify the project	Select one:
Clearly presents the hypotheses tested	Select one:
Clearly presents the experimental design and statistical/analytical tools used	Select one:
Uses slides effectively to convey content	Select one:
Provides an overall clearly conceived and designed MS thesis	Select one:

SLO 4: Effective written communication of research in biology as evidenced by the written thesis:

States the research problem clearly, providing motivation for the research	Select one:
Synthesizes peer-reviewed literature appropriate for research topic	Select one:
Clearly describes appropriate scientific and statistical methods/tools	Select one:
Presents results clearly and succinctly	Select one:
Uses appropriate graphics	Select one: Select one:
Comes to conclusions that are supported by the results	

Please return form to biolgrad@clemson.edu.

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Appendix V. Rubric for Assessing Student Learning Outcomes
Environmental Toxicology – MS
Thesis and Defense

Student Name:
Defense Date:
Advisor Name:

SLO 1: Knowledge of principles and theories in Environmental Toxicology as demonstrated in the thesis defense:

Demonstrates adequate knowledge of biochemical and cellular processes	Select one:
Demonstrates adequate knowledge of physiological effects and dose-response relationships	Select one:
Demonstrates adequate knowledge of ecotoxicology	Select one:
Demonstrates adequate knowledge of environmental chemistry: fate and routes	Select one:
Demonstrates adequate knowledge of particular sub-discipline of study	Select one:

SLO 2: Application of scientific methods in Environmental Toxicology as evidenced in the written thesis:

States the research problem clearly, providing motivation for undertaking the research	Select one:
Demonstrates sound knowledge of literature in the area, and of prior work on the specific research problem	Select one:
Shows a good understanding of how to use methods/tools effectively	Select one:
Defends use of particular methods/tools clearly and logically	Select one:

SLO 3: Effective oral communication of research in Environmental Toxicology as evidenced by the thesis presentation:

Presents sufficient background information to justify the project	Select one:
Clearly presents the hypotheses tested	Select one:
Clearly presents the experimental design and statistical/analytical tools used	Select one:
Uses slides effectively to convey content	Select one:
Provides an overall clearly conceived and designed MS thesis	Select one:

SLO 4: Effective written communication of research in biology as evidenced by the written thesis:

States the research problem clearly, providing motivation for the research	Select one:
Synthesizes peer-reviewed literature appropriate for research topic	Select one:
Clearly describes appropriate scientific and statistical methods/tools	Select one:
Presents results clearly and succinctly	Select one:
Uses appropriate graphics	Select one:
Comes to conclusions that are supported by the results	Select one:

Please return form to biolgrad@clemson.edu.

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Appendix VI. Rubric for Assessing Student Learning Outcomes
Microbiology – MS Thesis and Defense

Student Name:
Defense Date:
Advisor Name:

SLO 1: Knowledge of principles and theories in microbiology as demonstrated in the thesis defense:

Demonstrates adequate knowledge of general principles and theories in microbiology	Select one:
Demonstrates adequate knowledge of particular subdiscipline of study	Select one:

SLO 2: Application of scientific methods in microbiology as evidenced by the written thesis:

States the research problem clearly, providing motivation for undertaking the research	Select one:
Demonstrates sound knowledge of literature in the area, and of prior work on the specific research problem	Select one:
Shows a good understanding of how to use methods/tools effectively	Select one:
Defends use of particular methods/tools clearly and logically	Select one:

SLO 3: Effective oral communication of research in microbiology as evidenced by the thesis presentation:

Provides sufficient background information to justify the project	Select one:
Clearly presents the hypotheses tested	Select one:
Clearly presents the experimental design and statistical/analytical tools used	Select one:
Uses slides effectively to convey content	Select one:
Provides an overall clearly conceived and designed MS thesis	Select one:

SLO 4: Effective written communication of research in microbiology as evidenced by the written thesis:

States the research problem clearly, providing motivation for the research	Select one:
Synthesizes peer-reviewed literature appropriate for research topic	Select one:
Clearly describes appropriate scientific and statistical methods/tools	Select one:
Presents results clearly and succinctly	Select one:
Uses appropriate graphics	Select one:
Comes to conclusions that are supported by the results	Select one:

Please return form to biolgrad@clemson.edu.

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Appendix VII. Rubric for Assessing Student Learning Outcomes- Ph.D. Comprehensive Exams

Rubric for Assessing Student Learning Outcomes
Biological Sciences – PhD
Comprehensive Exam

Student Name:
Comprehensive Exam Date:
Advisor Name:

SLO 1: Knowledge of principles and theories in biology as demonstrated in the comprehensive exams:

Demonstrates extensive knowledge of general principles and theories in biology	
Demonstrates extensive knowledge of particular subdiscipline of study	

Please return form to biolgrad@clemson.edu.

Rubric for Assessing Student Learning Outcomes
Microbiology – PhD
Comprehensive Exam

Student Name:
Comprehensive Exam Date:
Advisor Name:

Rubric for Assessing Student Learning Outcomes
Environmental Toxicology – PhD
Comprehensive Exam

Student Name:
Comprehensive Exam Date:
Advisor Name:

SLO 1: Knowledge of principles and theories in Environmental Toxicology as demonstrated in the comprehensive exams:

Demonstrates adequate knowledge of biochemical and cellular processes	
Demonstrates adequate knowledge of physiological effects and dose-response relationships	
Demonstrates adequate knowledge of ecotoxicology	
Demonstrates adequate knowledge of environmental chemistry: fate and routes	
Demonstrates adequate knowledge of particular sub-discipline of study	

Please return form to biolgrad@clemson.edu.

Please return form to biolgrad@clemson.edu.

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Appendix VIII. Rubric for Assessing Student Learning Outcomes Biological Sciences – PhD Dissertation and Defense

Student Name:
Defense Date:
Advisor Name:

SLO 2: Application of scientific methods in biology as evidenced by the written dissertation:

States the research problem clearly, providing motivation for undertaking the research	Select one:
Demonstrates sound knowledge of literature in the area, and of prior work on the specific research problem	Select one:
Shows a good understanding of how to use methods/tools effectively	Select one:
Defends use of particular methods/tools clearly and logically	Select one:
Shows ability to propose future research questions	Select one:

SLO 3: Effective oral communication of research in biology as evidenced by the dissertation defense:

Presents sufficient background information to justify the project	Select one: Select one:
Clearly presents the hypotheses tested	
Clearly presents the experimental design and statistical/analytical tools used	Select one:
Uses slides effectively to convey content	Select one:
Provides an overall clearly conceived and designed PhD dissertation	Select one:

SLO 4: Effective written communication of research in biology as evidenced by the written dissertation:

States the research problem clearly, providing motivation for the research	Select one:
Synthesizes peer-reviewed literature appropriate for research topic	Select one:
Clearly describes appropriate scientific and statistical methods/tools	Select one: Select one:
Presents results clearly and succinctly	
Uses appropriate graphics	Select one:
Comes to conclusions that are supported by the results	Select one:

Please return form to biolgrad@clemson.edu.

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Appendix IX. Rubric for Assessing Student Learning Outcomes
Environmental Toxicology – PhD Dissertation and Defense

Student Name:
Defense Date:
Advisor Name:

SLO 2: Application of scientific methods in Environmental Toxicology as evidenced by the written dissertation:

States the research problem clearly, providing motivation for undertaking the research	Select one:
Demonstrates sound knowledge of literature in the area, and of prior work on the specific research problem	Select one:
Shows a good understanding of how to use methods/tools effectively	Select one:
Defends use of particular methods/tools clearly and logically	Select one:
Shows ability to propose future research questions	Select one:

SLO 3: Effective oral communication of research in Environmental Toxicology as evidenced by the dissertation defense:

Presents sufficient background information to justify the project	Select one:
Clearly presents the hypotheses tested	Select one:
Clearly presents the experimental design and statistical/analytical tools used	Select one:
Uses slides effectively to convey content	Select one:
Provides an overall clearly conceived and designed PhD dissertation	Select one:

SLO 4: Effective written communication of research in Environmental Toxicology as evidenced by the written dissertation:

States the research problem clearly, providing motivation for the research	Select one:
Synthesizes peer-reviewed literature appropriate for research topic	Select one:
Clearly describes appropriate scientific and statistical methods/tools	Select one:
Presents results clearly and succinctly	Select one:
Uses appropriate graphics	Select one:
Comes to conclusions that are supported by the results	Select one:

Please return form to biolgrad@clemson.edu.

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Appendix X. Rubric for Assessing Student Learning Outcomes Microbiology – PhD Dissertation and Defense

Student Name:
Defense Date:
Advisor Name:

SLO 2: Application of scientific methods in microbiology as evidenced by the written dissertation:

States the research problem clearly, providing motivation for undertaking the research	Select one:
Demonstrates sound knowledge of literature in the area, and of prior work on the specific research problem	Select one:
Shows a good understanding of how to use methods/tools effectively	Select one:
Defends use of particular methods/tools clearly and logically	Select one:
Shows ability to propose future research questions	Select one:

SLO 3: Effective oral communication of research in microbiology as evidenced by the dissertation defense:

Presents sufficient background information to justify the project	Select one:
Clearly presents the hypotheses tested	Select one:
Clearly presents the experimental design and statistical/analytical tools used	Select one:
Uses slides effectively to convey content	Select one:
Provides an overall clearly conceived and designed PhD dissertation	Select one:

SLO 4: Effective written communication of research in microbiology as evidenced by the written dissertation:

States the research problem clearly, providing motivation for the research	Select one:
Synthesizes peer-reviewed literature appropriate for research topic	Select one:
Clearly describes appropriate scientific and statistical methods/tools	Select one:
Presents results clearly and succinctly	Select one:
Uses appropriate graphics	Select one:
Comes to conclusions that are supported by the results	Select one:

Appendix XI. Resources for Graduate Students with Disabilities

For accommodations related to job functions:
Access and Equity (ADA)
Office of Access Compliance and Education 223 Holtzendorff Hall

Priscilla Harrison, ADA Coordinator 864-656-3553
priscih@clemson.edu

What to do:
Meet with someone from Access and Equity to disclose disability and discuss possible accommodations.

For classroom or research accommodations:
Student Accessibility Services (SAS) Requesting Accommodations - Student Accessibility Services Suite 239 Academic Success Center Building
864-656-6848

Margaret Camp, Director mmcamp@clemson.edu

What to do:
Meet with someone from Student Accessibility Services to disclose disability and discuss possible accommodations.
Provide documentation of disability (contact SAS for guidelines)

Appendix XIII. Graduate Student Mandatory Safety Training

All personnel working or teaching in laboratories must complete the Chemical Safety course administered online by the Clemson department of Occupational and Environmental Safety. Safety requirements vary based on your research area. Your advisor will provide you a list of required safety modules that must be completed for your research area.

Safety training, including chemical, biological, and radiation training modules can be completed on-line at the Occupational and Environmental Safety website.

Appropriate training must be completed prior to beginning laboratory or fieldwork.
Research Safety provides biohazard waste and sharps collection containers, plus disposal. For assistance with disposal of biohazard wastes, contact the Hazadous Materials Manager, June Carroll (864-656-1770 or juneb@clemson.edu). Notify Rebecca Ackerman (arebecc@clemson.edu, 864-656-6189, 334 Long Hall), in the departmental safety office, for any questions or issues related to chemical hygiene in BioSci.

You should also speak with your advisor regarding laboratory safety and core facilities.

Information on Safety Training Requirements for New Graduate Students

All new BioSci graduate students must complete **MANDATORY** safety training in which the following online trainings **MUST BE COMPLETED** by new graduate students **BEFORE teaching.**

All the required online training courses listed can be found at Clemson University's Human Resources Tiger Training website (https://www.clemson.edu/human-resources/talent-and-org-dev/tigertraining.html) and Clemson University's Office of Research Safety's training website (https://www.clemson.edu/research/safety/BioRAFT/Training%20Materials.html), and therefore require log in with Clemson University credentials.

Fire Extinguisher Training (online):

https://www.clemson.edu/human-resources/talent-and-org-dev/tigertraining.html Under **Accessing**

Tiger Training, click on the link at Go to Tiger Training.

Biosafety and Biohazardous Waste (online):

https://www.clemson.edu/research/safety/BioRAFT/Training%20Materials.html Use the direct

link under **Biological Safety**

Hazardous Communication Training (online):

https://www.clemson.edu/research/safety/BioRAFT/Training%20Materials.html Use the direct

link under **Chemical**

Hazardous Waste Management Training – How to Dispose of Chemical Wastes (Labs) (online):

https://www.clemson.edu/research/safety/BioRAFT/Training%20Materials.html
Use the direct link under **Chemical**

Lab Safety and Chemical Hygiene Training (online):

https://www.clemson.edu/research/safety/BioRAFT/Training%20Materials.html Use the direct

link under **Chemical**

Complete all five online trainings mentioned above. Certificates of completion will be generated for each training course upon completion and upon obtaining an acceptable score on an online quiz. Certificates must be emailed to Rebecca Ackerman at arebecc@clemson.edu **in order to be cleared to teach.**

Disclaimer
Any additional safety training requirements for the graduate student pertaining to research will be the responsibility of the PI. This GTA training is specifically for the graduate student who will have a teaching assistantship. Therefore, material presented will be for training to prep, work, and teach in the Biological Sciences teaching labs. Some of the safety training will pertain to research but not all of it; therefore, graduate students will receive additional training from the PI in relation to research. GTA safety training personal are not responsible for research safety training.

Appendix XIV. Contact Information for Departmental and University Staff and Their Duties Related to Graduate Students

Carla Brewer (153 Long Hall; cjdunca@clemson.edu, 864-656-0854): Registration Coordinator (Overrides for signing up for courses)

Amanda Roberts (132 Long Hall; aorr2@clemson.edu, 864-656-2328): Main Office Administrative Assistant (Scheduling use of the departmental vehicles, issuing departmental visitor parking permits, scheduling conference rooms, issuing keys, issuing paper and supplies, assisting with the photocopiers)

Ginger Foulk (236 Long Hall; foulk@clemson.edu, 864-656-4224): Project Coordinator (Manages website, social media, seminar speaker travel/logistics, marketing, event planning, outreach events)

Melissa Fuentes (fuente2@clemson.edu): Vertebrate Collection Curator

Candice Blassingame (147 Long Hall; blassin@clemson.edu or biolgrad@clemson.edu, 864-656-3587): Graduate Student Services Coordinator (**All graduate-student related questions**, including payroll)

Weston Link (240 Long; westonl@clemson.edu, 864-656-6273): Building Manager for Jordan Hall and BBC Museum of NH (manages all building/lab renovations/projects/constructions, general maintenance and repair, ethanol stockroom, radiation badges, service contract issues)

Charles Allen (impala@clemson.edu, 864-656-0550): College of Science Building Manger for Long Hall (building/lab renovations/projects/constructions, general maintenance and repair)

Teri Elliott (132B Long Hall; telltt@clemson.edu, 864-656-2328): Administrative Coordinator (manages calendar and schedules meetings with Chair; HR Liaison, payroll for faculty/staff/graduate students/undergraduate student workers)

Rhonda Powell (G-24 Life Sciences Facility, rhondar@clemson.edu, 864-656-1264): Clemson Light Imaging Facility Manager

Chris Krouchick (149 Long Hall; ckrouch@clemson.edu, 864-656-8962): College of Science Financial Analyst (verifies funds before travel, IDOs, expenditure/revenue reports)

Tonya McManus (140 Long Hall; tmcmanu@clemson.edu, 864-656-1634); College of Science Accounts Payable and Receivable Accountant (receives and processes p-card receipts, processes BuyWays orders, travel reimbursements, invoicing)

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