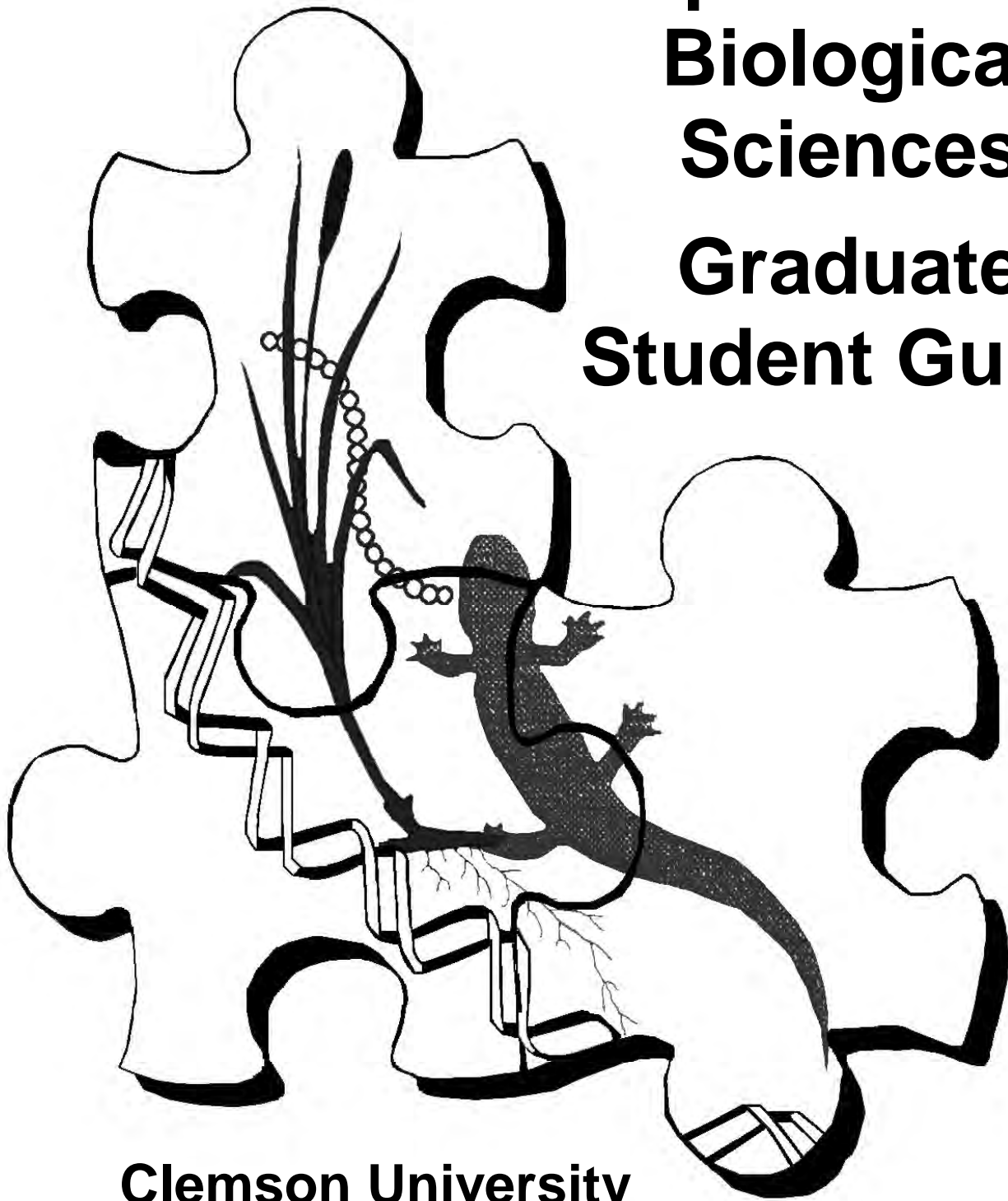


**Department of
Biological
Sciences
Graduate
Student Guide**



Clemson University

2019-2020

Welcome to the Graduate Programs in the Department of Biological Sciences



Department Chair

Dr. Saara DeWalt, saarad@clemson.edu 132C Long Hall

Graduate Program Coordinators

Microbiology and Chair of the Graduate Advisory Committee:

Dr. Barbara Campbell, bcampb7@clemson.edu or micrograd@clemson.edu, 155B LSF

Biological Sciences:

Dr. William Baldwin, baldwin@clemson.edu or biolgrad@clemson.edu, 235 Long Hall

Graduate Program Administrator

Ms. Jay Lyn Martin, jaylyn@clemson.edu or biolgrad@clemson.edu, 144 Long Hall

Contact Information

Department of Biological Sciences

Clemson University

132 Long Hall

Clemson, SC 29634-0314

Phone: 864-656-2328

Fax: 864-656-0435

Web: clemson.edu/science/departments/biosci/

This Grad Student Guide, last updated 7/10/2019, can be found at:
clemson.edu/science/departments/biosci/academics/graduate/resources.html

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 programs:

Microbiology, M.S.

Microbiology, Ph.D.

Biological Sciences, M.S. (thesis)

Biological Sciences, M.S. (non-thesis)

Biological Sciences, Ph.D.



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2019-2020
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Welcome and Introduction

The Faculty of Biological Sciences welcomes you into the graduate program. There are many exciting and challenging disciplines within our department. As a graduate of either the Biological Sciences 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 our graduate program 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 Biological Sciences or Microbiology. Thus, these Guidelines constitute a Program supplement to the Clemson University Graduate School Policy Handbook:

<http://www.clemson.edu/graduate/>. It is important to note that these Guidelines do not replace the Graduate School's policies and procedures. Graduate students are expected to review a copy of the Graduate School's policies and procedures and familiarize themselves with all relevant sections. It is the graduate student's responsibility to become familiar with 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 and/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 Major Professor/Advisor are available to assist you in interpreting these Guidelines. It is your responsibility to use these resources and to comply with the requirements and expectations detailed in these Guidelines.

A graduate student checklist of important milestones is included in these Guidelines and summarizes the primary deadlines that you must meet.

I. Organizational Structure Relevant to Graduate Students

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

1. Major Professor/Advisor: Chosen by mutual interest, consent and agreement of the student and that faculty member and approved by the Program Coordinator. The Major Professor advises the graduate 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.
2. Advisory Committee: The Advisory Committee is chaired by the Major Professor. Other committee members are selected by the student in consultation with the Major Professor and are approved by the Program Coordinator.
3. Graduate Programs Coordinator: The Graduate Programs Coordinator chairs the Graduate Advisory Committee (GAC – see below), oversees both the Graduate Program in Biological Sciences and Microbiology, and coordinates assessment of both graduate programs. The Graduate Programs Coordinator, together with the GAC, administers compliance with these Graduate Student Guidelines and revisions as deemed appropriate by the Program Faculty.
Graduate Programs Coordinator: Dr. Barbara Campbell
4. Graduate Program Coordinator (GPC) for Biological Sciences: The Biological Sciences Program Coordinator coordinates graduate admissions and current graduate students in the on-campus M.S. and Ph.D. degree programs in Biological Sciences. **Biological Sciences GPC: Dr. Bill Baldwin**
5. Graduate Program Coordinator (GPC) for Microbiology: The Microbiology Program Coordinator coordinates graduate admissions and current graduate students in the M.S. and Ph.D. degree programs in Microbiology. **Microbiology GPC: Dr. Barbara Campbell**
6. 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: Dr. Christopher Parkinson (BioSci), Dr. Michael Sears (BioSci), Dr. Lisa Bain (ENTOX/BioSci), Dr. Zhicheng Dou (Micro), Dr. Vincent Richards (Micro)**
7. Dean for the College of Science: Administers teaching activities and faculty responsibilities in the College, administers College scholarships and fellowships, and approves all graduate student Committee Selections and Plans of Study. **Dean: Dr. Cynthia Young**
8. 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: TBD**

II. Ph.D. and M.S. Program Information

A. Common Components to Ph.D. and M.S. Programs in BioSci and Microbiology

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](#).

Full-time Status

Graduate students on assistantships must register for a minimum of nine (9) credit hours during the fall and spring semesters to be considered full-time. If a student's assistantship continues into the summer, then the student must be enrolled in three (3) credit hours in each summer session or six (6) credit hours in the Long Summer Session. Students may take up to a maximum of 15 credit hours during the fall or spring.

Coursework

Specific coursework requirements based on degree program (Ph.D. vs. M.S.) are discussed in later sections. This section outlines coursework required by all students. Clemson's Directory of Classes and on-line registration can be found through the iRoar portal. The Graduate Student Catalog can be found at <http://www.registrar.clemson.edu/html/catalogGrad.htm>.

Seminar. The Department of Biological Sciences hosts a weekly guest lecturer as part of the Departmental Seminar series (BIOL 8120). For 2019-2020, the seminar will be held on Fridays from 3:30-4:30 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 both programs (Microbiology and Biological Sciences). Ph.D. students are required to pass BIOL 8120 both Fall and Spring semesters for their first 3 years or up to 6 semesters between their MS and PhD; M.S. students for their first two years. Exemption from this policy requires approval by the Graduate Programs Coordinator.

To pass BIOL 8120, enrolled graduate students are required to attend a minimum of 8 of the 10 Departmental or other approved seminars each semester; absences beyond this level will result in a Fail. Seminars presented in other departments may count towards meeting this requirement, but the student is responsible for informing the faculty coordinator for BIOL 8120 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. **2019-2020 Seminar Coordinator: Dr. David Feliciano** (dfelici@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 perfect a student's ability to critically read, interpret, discuss, and present scientific literature and results.

Graduate students in both Microbiology and Biological Sciences degree programs are required to pass the Reading Group course (BIOL 8070 or MICR 8070) both Fall and Spring semesters for

their first 2 years for MS students; first 3 years in the PhD; or up to 6 semesters between the MS and PhD degrees if both are completed at Clemson. Participation includes attendance as well as leading the discussion at least once per semester. 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 Graduate Programs Coordinator.

Research Credits. Every enrolled graduate student must enroll in *at least one* (1) credit of MICR or BIOL 8910 or 9910 each semester. Exemption from this policy requires approval from the Graduate Programs Coordinator.

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 the start of the program.

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.

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 and will result in the student's file being reviewed by GAC to determine the consequences of this failure. At a minimum, a letter will be sent to both student and faculty mentor.

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

Below are degree requirements for students who enter the Biological Science or Microbiology Ph.D. Programs in the Department of Biological Sciences.

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 Microbiology and Biological Sciences 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 his/her major advisor and graduate advisory committee and ensure all requirements are fulfilled. The faculty may not remind students of all of the procedures, deadlines, etc. Likewise, the student is ultimately responsible for complying with the regulations of the Department of Biological Sciences and Clemson University Graduate School. Graduate School policies and procedures can be found in the [Graduate School Policy Handbook](#).

Ph.D. Program Requirements

The Doctoral Program will involve:

- Advisory Committee Selection
- Preparing a Plan of Study (Filing GS2, [Appendix 1](#))
- Filing Annual Progress Reports (APR)
- Dissertation Proposal Preparation and Defense (Proposal Defense Verification Form, [Appendix 2](#))
- Coursework including Seminar (BIOL 8120) and Reading Group (BIOL/MICR 8070)
- Comprehensive Exam (Filing GS5D)
- Research and Dissertation
- Dissertation Defense (Filing GS7D)

Each of these requirements is discussed in more detail below.

Ph.D. Advisory Committee Selection

The advisory committee is *established no later than the end of the third semester after the student has begun to his/her program*. This committee is expected to meet *at least once per year* and as needed.

The advisory committee approves the student's degree curriculum, supervises the graduate program, administers the Ph.D. comprehensive exams, administers 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 or major advisor and normally directs the student's dissertation or thesis, if required. A minimum of four faculty members are to be selected by a student seeking a doctoral degree.

See [Section VI](#) for more instructions on selecting committee members.

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 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 (filing Proposal Defense Verification form, [Appendix 2](#)).
- Beginning of third year to choose option 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 5 years after filing the GS5 for the Dissertation Defense (filing GS7D).

Ph.D. Plan of Study and Course Work

Ph.D. students must have a minimum of 60 credits hours in order to graduate; 30 of these credits must be beyond the Master's degree if one was previously obtained; and 18 semester hours of dissertation research (BIOL or MICR 9910) are required for completion of the Ph.D. 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 his/her advisory committee and submitted in the Plan of Study by the end of the third semester. The Plan of Study must reflect the required 60 credit hours necessary for graduation. See [Section VI](#) for instructions on filing the Plan of Study.

Seminar enrollment and attendance: Ph.D. students will enroll in BIOL 8120 (1 credit per semester; Pass/Fail) for a minimum of 6 credits and a maximum of 8 credits. Students with credit for BIOL 8120 from their MS degree are required to take up to 6 credits between the two degrees. Attendance of seminars even when not enrolled is highly encouraged.

Seminar Presentation: Ph.D. students will conduct at least one seminar 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.

Reading Group: As noted in Section A, enrollment in a reading group course (BIOL or MICR 8070; 1 credit per semester; Pass/Fail) is required for degree minimum of 6 credits and a maximum of 8 credits. Students with credit for a reading group from their MS degree are required to take up to 6 credits between the two degrees. Attendance at reading groups even when not enrolled is highly encouraged.

For students entering the **Ph.D. program in Microbiology** directly from a bachelor's program, graduate coursework must include courses from at least three of the following areas:

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

Although there is no required number of credits of coursework for the Ph.D. in Microbiology beyond the 18 credits of dissertation research for students entering with a MS degree, a core of graduate coursework including courses from the above emphasis areas is expected.

Ph.D. Dissertation Proposal Preparation and Defense

A written research proposal outlining the student's dissertation research project must be prepared 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.) as chosen by the student and advisor. **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 [Section VII](#) 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 Proposal Defense Verification Form ([Appendix 2](#)) to Ms. Jay Lyn Martin. Students may be asked to revise their proposals and re-defend with the advisory committee, if the committee feels such actions are warranted as a result of their first defense.

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 no later than the end of year 3 after initiation 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 and advisory committee. The two formats are described in detail in [Appendix 3](#).

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 biological/microbiological knowledge of the student using a set of rubrics on a form found in [Appendix 4/5](#). The advisor will turn in one form with the committee's consensus evaluation after the comprehensive exams to Ms. Jay Lyn Martin (144 Long).

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 his/her 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. A key part of developing into a scientist is to be able to manage time commitments and responsibilities of multiple demands on one's time.

See the instructions in [Section VIII](#) for scheduling the final defense. 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 1 full week (7 days) before the final manuscript is due to the Graduate School.

The defense will include a public departmental seminar in which the student presents the results of his/her research and followed by a “closed-door” oral defense of the research with the advisory committee. A successful “Pass” of the defense will result in filing the GS7D form with the Graduate School. The committee will assess the student for departmental assessment purposes using a set of rubrics on a form found in [Appendix 8/9](#). The advisor will turn in one form (the committee’s consensus) after the defense to Ms. Jay Lyn Martin (144 Long).

Ph.D. Student Financial Support / Tuition / Fees

Teaching and Research Assistantships

Graduate students accepted into the Biological Sciences 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). To be eligible for a GTA or GRA, a student must be enrolled full-time. Full-time status entails being enrolled in at least nine (9) graduate-level credit hours in fall and spring. Graduate students on an assistantship in the summer must enroll in three (3) credits each of the two summer sessions. 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.

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 5 years for Ph.D. students. The current rate for a 9-month appointment (no teaching in summer) is \$22,000 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 \$24,000 per year, starting as soon after the form is filed and the change of pay can be processed. Annual GTA stipends may be supplemented by Faculty Advisors’ grant funds or from other sources.

GRAs are awarded by individual Faculty Advisors from funds available on research grants upon acceptance to the program. Individual stipend amounts and conditions of renewal are determined by individual Faculty Advisors, but currently funded GRA stipends normally range from \$22,000 to \$27,000 depending upon the tenure of the student (years in program) and availability of supplemental funds. GRA support is negotiated by prospective students with individual Faculty Advisors.

A limited number of University fellowships are available on a competitive basis. Additional information can be found at this site: <http://www.clemson.edu/graduate/finance-tuition/fellowships.html>.

Ph.D. Program Timetable

Requirement	Relevant Form	Deadline (deadline for students entering Fall 2019)
Advisory Committee Selection	Online	By end of Semester 3 (December 2020)
Plan of Study	Online	By end of Semester 3 (December 2020)
Dissertation Proposal and Defense	Proposal Defense Verification	By end of Year 2 (July 2021)
Comprehensive Exam	GS5D, Rubric	By end of Year 3 (July 2022)
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)	APR	Must be enrolled up to 6 credits at CU. Suggested 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

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

The Master of Science (M.S.) degree is conferred to those who have demonstrated mastery of general biology and of advanced biology in areas of concentration. The major emphasis of the Master's programs in Microbiology and Biological Sciences 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 his/her major advisor and graduate advisory committee and ensure all requirements are fulfilled. The faculty may not remind students of all of the procedures, deadlines, etc. Likewise, the student is ultimately responsible for complying with the regulations of the Department of Biological Sciences and Clemson University Graduate School. Graduate School policies and procedures can be found in the [Graduate School Policy Handbook](#).

M.S. Program Requirements

The Master's Program will involve:

- Advisory Committee Selection
- Plan of Study ([Appendix 1](#))
- Filing Annual Progress Reports (APR)
- Thesis Proposal Preparation and Defense (Filing Proposal Defense Verification Form, [Appendix 2](#))
- Coursework including Seminars and Reading Groups
- Research and Thesis
- Thesis Defense (Filing GS7M)

M.S. Advisory Committee Selection

The advisory committee should *be established by the end of the first semester*, but no later than by the end of the second, after the student has begun to identify his/her research area.

The 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 or major advisor and normally directs the student's dissertation or thesis, if required. A minimum of three faculty members are to be selected by a student seeking a M.S. degree.

See [Section VI](#) for more instructions on selecting a committee.

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.
- During the third semester or earlier for the Oral Defense of the Thesis Proposal.
- At least once in the fourth and any subsequent semesters to review progress.
- The final semester for the thesis defense (filing GS7M).

M.S. Plan of Study (GS2) and Course Work

The M.S. degree program requires a total of 30 semester hours of graduate credits: 24 of these hours are course work (with at least 12 from 8000-level courses) and a minimum of 6 hours of thesis research (BIOL or MICR 8910).

An appropriate plan of coursework to fulfill this requirement will be completed by the student and his/her advisory committee and submitted in the Plan of Study for approval by the Graduate School *no later than the middle of the second semester*. The Plan of Study must reflect the required 30 credit hours necessary for graduation. See [Section VI](#) for instructions for filing it.

Seminar enrollment and attendance: M.S. students will enroll in BIOL 8120 (1 credit per semester; Pass/Fail) each semester of their first two years. If the M.S. program continues beyond the second year, enrollment is optional, but attendance is mandatory.

Seminar presentation: M.S. students should conduct at least one seminar 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.

Reading group: As noted in Section A, M.S. students will enroll in BIOL 8070 or MICR 8070 (1 credit per semester; Pass/Fail) each semester of their first two years. If the M.S. program continues beyond the second year, enrollment is optional, but attendance is highly encouraged.

Course requirements for the **Microbiology M.S.** degree include course work in at least three of the following areas:

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

M.S. Thesis Proposal Preparation and Defense

No later than the end of the third semester, a research proposal outlining the student's thesis research project must be prepared for discussion and approval by the Advisory Committee. The proposal will be written in federal grant style (NIH, NSF, USDA, etc.).

See the instructions in *Section VIII* for scheduling the proposal defense. The proposal *must* be provided to the committee **at least 14 days before the defense**. The student should email the appropriate GPC at this time stating that the proposal has been provided to the committee.

An oral seminar outlining the research plan is presented to the 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.

Upon successful defense by the student, the student and committee members will fill out and submit the Proposal Defense Verification Form ([Appendix 2](#)) to Ms. Jay Lyn Martin. Students may be asked to revise their proposals and re-defend with the advisory committee, if the committee feels such actions are warranted as a result of their first defense.

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 his/her 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. GAC expects students to submit a manuscript from their thesis within one year of graduation.

At the end of his/her program, a student will defend their thesis research. The defense will include a public departmental seminar in which the student presents the results of his/her research and followed by a “closed-door” oral defense of the research with the advisory committee and interested members of the departmental faculty. See the instructions in [Section VIII](#) for scheduling the thesis defense. The thesis *must* be provided to the committee **at least 14 days** before the defense. **The student should email the appropriate GPC stating that the thesis has been provided to the committee at this time.**

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 class notes, exams, general biology and disciplinary texts, and by remaining current in the literature related to their field of study. The defense of the thesis will focus on the hypotheses, methods, results, and conclusions in the thesis. The student should be thoroughly conversant with all aspects of the research and be able to defend the methods, data, and conclusions. A successful “Pass” of the defense will result in filing the GS7M form with the Graduate School. The committee will assess the student for departmental assessment purposes using a set of rubrics on a form found in [Appendix 6/7](#). The advisor will turn in one form (the committee’s consensus) after the defense to Ms. Jay Lyn Martin (144 Long).

M.S. Student Financial Support / Tuition / Fees

Teaching and Research Assistantships

Graduate students accepted into the Biological Sciences 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). 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 3 years for M.S. candidates. 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.

The current rate for a 9-month appointment (no teaching in summer) is \$22,000 for M.S. students. Annual GTA stipends may be supplemented by Faculty Advisors’ grant funds.

GRAs are awarded by individual Advisors from funds available on research grants upon acceptance to the program. Individual stipend amounts and conditions of renewal are determined by individual Advisors, but GRA stipends normally range from \$22,000 – \$24,000 depending upon tenure of the student (years in program) and availability of supplemental funds. GRA support is negotiated by prospective students with individual Advisors.

A limited number of University fellowships are available on a competitive basis. Additional information can be found at this site <http://www.clemson.edu/graduate/finance-tuition/fellowships.html>.

M.S. Program Timetable

Requirement	Relevant Form	Deadline (deadline for students entering Fall 2019)
Advisory Committee Selection	Online	By end of Semester 1 (December 2019)
Plan of Study	Online	By end of Semester 2 (May 2020)
Thesis Proposal and Defense	Proposal Defense Verification	By end of Semester 3 (December 2020)
Thesis Submission / Defense	GS7M, Rubric	By end of Year 3 (May 2022)
Annual Progress Report (APR)	APR	Every year
Research Presentation	APR	Every year
Seminar Attendance (BIOL 8120)	APR	Must be enrolled in years 1 and 2. Suggested 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

D. M.S. *en route* to Ph.D. program

Clemson has adopted a process by which a doctoral student *may* be granted a master's degree in his/her 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 the following situation:

Good Academic Standing/Taken and Passed Comps/ Master's Threshold Achieved.

A *doctoral* student who has enough credit hours to receive a master's degree and has satisfied all the requirements for the master's degree, and who has a >3.0 GPA. 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.

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.

E. M.S. Bypass to 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.

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

- a) The student must have successfully completed a minimum of 2 semesters of academic work in the M.S. program, accumulating a minimum of 6 credit hours of BIOL/MICR coursework at the 8000 level plus 3 credit hours of thesis research (BIOL/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. Advisory Committee Selection), met with their committee, and submitted a Plan of Study for the M.S. degree.
- b) Following discussions between the student and his/her 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 manuscripts, or a list of other formal presentations, can be included with the request. The advisor should also submit a letter, written in consultation with the student's advisory committee, supporting the student's request.
- c) GAC will either approve or disapprove the request. In the case of approval, GAC will also provide a deadline extension of the M.S. proposal defense, which is normally due by the end of the third semester, in order for the student to include work respective of a Ph.D. proposal.

- d) 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 8 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 his/her advisory committee.
- e) 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 the Ph.D. A final decision of the application to bypass the M.S. degree will then be made by GAC.
- f) 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.
- g) If the student is approved to switch to the Ph.D., the 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 4 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.
- h) Students who use this option are not awarded the M.S. degree.

F. Non-thesis M.S. in Biological Sciences

The non-thesis M.S. in Biological Sciences is designed primarily for K-12 teachers and others interested in biological sciences education. Students generally are not provided financial support by the Department of Biological Sciences if they are pursuing a non-thesis M.S. Students must be accepted into the non-thesis option at the time of admittance or appeal to the GAC to switch from the thesis to the non-thesis option. Switching to the non-thesis option will be allowed only in unforeseen, exceptional circumstances that prohibit the student from finishing the research or the thesis, such as a serious health issue or loss of advisor. In such cases, the student must write a formal request to the GAC, endorsed by their advisory committee, and have met all deadlines and requirements for the degree program they were pursuing at the time of the request.

Candidates for the non-thesis option must complete a total of 30 credit hours of graduate coursework. At least 18 of the 30 hours must be at the 8000-level. A research proposal and project whose results are presented in written format is also a requirement. The scope of the research project is not as extensive as the thesis required in the thesis MS program; however, it is expected that students will conduct original scientific research and write a document of the caliber of a manuscript suitable for submission to a peer-reviewed journal. The student and the student's graduate committee will determine the subject of the research project. The timeline for accomplishing these tasks is the same as for the thesis option of the M.S. degree (see [page 18](#)).

III. Starting Graduate School

A. New Student Hiring Directions

1. All new graduate assistants to be hired by Biological Sciences should bring a completed New Employee Data Sheet to Jay Lyn Martin (144 Long).
2. I-9: Complete Section 1 (Employee Information & Attestation), indicate your citizenship, and sign and date the form.
 - a. **U.S. citizens** should bring their completed I-9 to Jay Lyn Martin and give her page 7.
 - b. **International students** should take their I-9 to Pablo Unda (punda@clermson.edu) in Human Resources.
3. Everyone needs to bring identification documents with their I-9 to Jay Lyn (U.S citizens) or Pablo (International students). You will need to bring either 1 official document from list A or 1 official document from list B and 1 official document from list C. Photocopies are not acceptable. You can also have the I-9 notarized by a notary or filled out at ANY universities HR department.
4. If you bring one of the documents from list A, you should also bring your official social security card (Photocopy not acceptable). 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.

From Human Resources: See the Student Employment Policy Summary and an Important Payroll Information sheet available from Jay Lyn Martin. The Student Employment Policy Summary familiarizes you with important Clemson University employment policy and timekeeping requirements. The Important Payroll Information sheet will provide instructions for setting up your password and determining your primary user name (if you have more than one), setting up your Direct Deposit, changing your W-4 tax withholding, viewing your paystub, and signing up to receive your W-2 tax form online (if desired).

Graduate Assistants should not exceed work hour limitations:

- 28 paid service hours per week for U.S. Citizens / 20 paid service hours per week for international students.
- Special provisions may apply for camps / seasonal programs meeting specific criteria.

Graduate Assistants must accurately report paid service hours worked in a timely manner.

Log in to the [Graduate and Resident Assistant Time Capture System](#) to report paid service hours worked.

1. Click link
2. Enter ID and password
3. Enter paid service hours or check the box to certify you did not work
4. Click submit

If at any time, you work as Graduate Student Hourly or Graduate Student Summer Employee, the time sheets you submit bi-monthly will substitute for the Time Capture.)

3. Action(s) taken for missed entries:

To comply with the Affordable Care Act (ACA), we must obtain and report paid service hours accurately and in a timely manner.

- 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.

B. 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 9 semi-monthly payments for Fall, and 9 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 local checking or savings account.

Directions for initiating your direct deposit can be found at:

http://www.clemson.edu/humanres/compensation/direct_deposit.html. It is possible to direct deposit in up to 5 different accounts. Students who have questions/problems with their payroll should contact Jay Lyn Martin (jaylyn@clemson.edu; 656-3587).

Fees

Each semester, there are various fees that each student must pay that include access to the health center, gymnasium (Fike), and software. For 2019-2020, the amount will be \$1144/semester for students on an assistantship. 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. Here is a link to the fees: <http://www.clemson.edu/cfo/student-financials/tuition-fees/index.html>. Most graduate students will be on an assistantship and therefore the relevant section of that site is found under "Full-Time Graduate Assistant Fees per Semester". Go to http://www.clemson.edu/employment/compensation/direct_deposit.html for instructions on how to complete the payroll Deduction Authorization Form.

Health Benefits

Clemson University requires all full-time (9 hours or more), on-campus graduate students to have health insurance coverage. It may be purchased through Clemson University or through other insurance policies that meet the University requirements. The Graduate School subsidizes the cost of health insurance. See the section "Full-Time Graduate and Graduate Assistant Insurance Rates" of this website for the cost of health insurance for the year: <http://www.clemson.edu/finance/student-financials/tuition-fees/index.html>. See this site for more information about the insurance: <http://www.clemson.edu/campus-life/student-health/>. If you have any questions about health and medical insurance, contact Vickie Metz (svickie@clemson.edu or 656-3561) at Redfern Health Center.

C. New Student Orientation

All new graduate students are required to attend Graduate Student Orientation, which is generally held in the week prior to the start of classes. Orientation includes TA training, fire safety training, Departmental orientation (with the Chair and members of the Departmental office and lab staff), and meetings with some current graduate students. If you are unable to attend orientation, you must contact the appropriate Graduate Program Coordinator (Biological Sciences: biograd@clermson.edu or Microbiology: micrograd@clermson.edu to make separate arrangements.

All TAs are required to register for and pass BIOL 8130. This colloquium is a 1-hour pass/fail course for all students who have not yet taught as a TA but **will be** teaching assistants in the Fall or **might be** teaching assistants at some time in the future. All new graduate TAs must register for BIOL 8130.

IV. Need-to-Know Information

A. Graduate Student Associations

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 at <https://sites.google.com/a/g.clemson.edu/bsgsa/customization/home> .

The BSGSA offers Travel Awards, on a competitive basis, of up to \$400 each, twice yearly to dues-paying members who have completed a minimum service requirement. Application forms and instructions can be obtained from a BSGSA officer. The current BSGSA officer roster can be obtained from Jay Lyn Martin (jaylyn@clermson.edu). BSGSA also has a group on Facebook.

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 the website: <http://www.grad.clemson.edu/gsg/>.

The GSG offers travel awards of up to \$750 (domestic) and \$1000 (international), each on a competitive basis during fall and spring semesters. Specific award details and instructions are subject to change. More information can be found at: <https://gsg.people.clemson.edu/gtgs.php>

B. 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 a number of 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 email software and wireless setup by taking the computer to CCIT (Freeman Hall) or emailing ithelp@clemson.edu to set up a time.

Poster printing. Posters can be printed by clicking the link below:
<https://ccit.clemson.edu/support/current-students/printing-plotting/>

C. Office Information

Graduate students are sometimes assigned a desk in research labs located in Jordan Hall. However, desks and filing cabinet space is also available in the graduate student office in 230/234 Long Hall. Contact the [BSGSA Secretary](#) for assistance. Students whose labs are located in the Life Sciences Facility are assigned desks in a common graduate student office in that facility. Contact Rick Moseley (remosel@clemson.edu) for assistance.

Mail. Graduate student mailboxes are located in 141 Long Hall. Mail should be addressed to Your Name, Department of Biological Sciences, 132 Long Hall, Clemson University, Clemson, SC 29634-0314. Please check your mailboxes regularly as messages, seminar notices, announcements, etc. are distributed in student mailboxes. Outgoing mail can be placed in the appropriate bin in 141 Long Hall. All personal U.S. mail must be stamped.

Building Access. Keys for access to the buildings, laboratories, and offices are assigned through the departmental office through Ms. Teri Elliott in 132 Long. 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 can be signed out from the departmental office as needed on a limited basis.

You are responsible for all keys given to you and for insuring that all areas used by you are locked when you leave. Outside doors to Long Hall and Jordan Hall are locked after 4:30 P.M. and on the weekend. Please return keys when they are no longer needed.

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

Photocopies. Photocopies machines are located in 135 and 149 Long Hall. The one in 135 is for research, while the one in 149 is for course/lab copying. Personal copying may not be done on the departmental copier. Ms. Teri Elliot can show you how to scan, print, and copy from these

machines. Copiers are available in the library and at commercial sites downtown for personal copying.

Phone / Fax. To make a local call, dial 9 followed by the number. Long distance calls (except 800 numbers) require a 9-digit code. Your research advisor can provide you this code for work-related calls/faxes. The departmental fax number is 864-656-0435.

Sending Express Shipments. To send an express package, please check with your research advisor to obtain their account information with UPS/FEDEX/DHL. You will be responsible for transporting the package to the appropriate drop off location. PAKMAIL (1085 Old Clemson Hwy #E, Seneca, SC 29672; 864-654-1717) is the closest location.

Departmental Vehicles. The department maintains two trucks and two vans for departmental teaching and research use. Be sure you are aware of all state regulations regarding the use of vehicles. Any ticket you receive will be your responsibility whether on campus or on the road. To reserve a departmental vehicle, contact Teri Elliott (telitt@clemson.edu) in the departmental office.

D. 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 <http://www.catbus.com/>.

Student parking is in the orange spaces and by permit only. Permits can be obtained from Parking Services in the University Union and information can be obtained at <http://www.clemson.edu/campus-life/parking/>.

E. 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 (Microbiology teaching labs).

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 from Dr. Terri Bruce (terri@clemson.edu). See <http://www.clemson.edu/centers-institutes/light-imaging/index.html> 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. Information regarding training and use of this facility can be found at the website: <http://www.clemson.edu/centers-institutes/cuadvancedmaterialscenter/electron-microscope/index.html> or by contacting Dr. Lax Saraf (lsaraf@clemson.edu).

Center for Genomics and Bioinformatics. This Center developed from the Clemson University Genomics Institute (CUGI) and will become operational in the next year. The Director is Dr. Christopher Parkinson (viper@clemson.edu).

South Carolina Botanical Garden. The South Carolina Botanical Garden has field areas (old fields, woods, a small stream, etc.) on a 7-acre site for programmatic use.

Clemson Experimental Forest. The Clemson Experimental Forest's 17,500 acres are dedicated to education, research, and demonstration in order 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 Russell Hardee, Forest Manager, 266B Lehotsky Hall, rhardee@clemson.edu, 656-4833).

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. Christina Wells (cewells@clemson.edu) is in charge of maintaining the teaching collection in the greenhouses. See <http://www.clemson.edu/cafls/brc/> 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 located in the Bob and Betsy Campbell Museum of Natural History. The collection is available for use in teaching and research. Contact Ms. Melissa Fuentes (fuentes2@clemson.edu, 656-3456), curator, for questions regarding the museum or its collections.

Herbarium. The Herbarium is also located in the Bob and Betsy Campbell Museum of Natural History. It maintains an excellent collection of local, regional, and worldwide floras. All

qualified graduate students are invited to utilize the herbarium. Ms. Dixie Z. Damrel (ddamrel@clemsun.edu, 656-7234) is the curator in charge of the herbarium.

Aquatic Animal Research Facility. Located in P&A, Room 26 and the adjacent corridors. Mr. John Smink (smink@clemsun.edu) is the Facilities Coordinator. 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 to Mr. Smink.

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. For more information contact Melody C. Willey, Director of Operations, mclrk@clemsun.edu.

Other department personnel who may be of assistance are listed in [Appendix 14](#).

F. Safety Manuals and Training

All personnel working or teaching in laboratories must complete the Chemical Safety course administered online by the campus Environmental Health and Safety Office. 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 Research Safety web site: <http://www.clemsun.edu/research/safety/>.

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 Environmental Compliance Officer at 656-1770 or 656-7309. Notify Dr. Donna Weinbrenner (donnaw@clemsun.edu, 656-1996), the departmental chemical hygiene and safety contact person, for any questions or issues related to chemical hygiene in Biological Sciences.

G. Travel Forms

Before making any travel arrangements, thoroughly review our travel procedures: https://docs.google.com/document/d/1KSsQCcZo5NmO_hh57WhU21FyrMxjiKjwfc-WNGLHXA4/edit?usp=sharing.

Forms requesting *permission to travel* or to report *expenses for in-state, out-of-state, and foreign travel* are available here: <http://www.clemsun.edu/procurement/travel/>. Check with Mr. Robinson (656-2330, rrobin9@clemsun.edu) for rules and regulations for booking travel or registering for conferences. Foreign travel requires extra time to be approved.

V. 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 and accessible through iRoar. See <http://www.clemson.edu/graduate/students/forms.html>. Completed original forms are submitted to the Graduate Enrolled Services Office (104-D Sikes Hall) and copies are kept by the Biological Sciences Department. See Jay Lyn Martin (144 Long Hall) for questions and to make copies.

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 (Appendix 1). The Plan of Study (formerly submitted as the GS2 form) is to be determined in consultation with your faculty advisor and graduate committee. 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. The procedure for selecting the advisory committee and Plan of Study can be found in [Section VI](#).

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.

Application for Graduation and Diploma Form (GS4). This form must be filled out and turned in several months prior to graduation (check on-line 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.

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.

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).

VI. Procedure for Selecting a Committee and Filing the Plan of Study

The selection of a graduate advisory committee and filing of the plan of study are now conducted online through iRoar. Please go to the Graduate School's website for detailed instructions: <http://www.clemson.edu/graduate/students/plan-of-study/index.html>.

Committee Composition (see the [Graduate School's policy](#) for the most up-to-date

instructions)

The majority of the advisory committee, including the major advisor, must be composed of Clemson University faculty who hold full-time, tenured or tenure-track positions (*i.e.*, 2 for a committee of 3 faculty members; 3 for a committee of 4 or 5 members). Either the major advisor or at least half of the committee must hold rank in the program offering the degree. If a minor is declared, this area must be represented on the committee. Faculty emeriti may serve as advisory committee members but may not serve as chair of the advisory committee. Part-time visiting and other nontenure-track faculty employed by Clemson University may serve on the advisory committee but may not serve as chair. Persons not employed by the University may serve on the advisory committee; if they serve as one of the statutory members of the committee, they must be approved by the Department. All duly appointed committee members have full voting status on the outcomes of all examinations given by the committee. It is possible for co-chairs to direct the activities of the advisory committee. Check with the appropriate Graduate Program Coordinator if you have any questions.

Change in Committee Composition: The student or a committee member may request a change in committee membership by selecting a new committee through the iRoar portal. However, such change must meet approval of all concerned. In the event of a conflict of opinion, the appropriate Graduate Program Coordinator will arbitrate the request. Any revision in committee membership will require submission of a new committee and approval by all committee members and appropriate administrators. A new GS2 Plan of Study must also be approved after changes in committee membership.

GS2 Committee Selection

To appoint a graduate advisory committee, the student will follow the directions on the [Graduate School's webpage](#) about the GS2 and select the button "GS2 Committee Selection". A drop-down list of faculty will appear for different departments. All faculty eligible to serve on graduate student committees can be found. Adjunct faculty will appear if all steps for their appointment have been completed, and they have been issued a Clemson id number and e-mail address. 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. **You should alert your committee members that they will be receiving these emails, particularly any adjunct faculty. E-mails go only to Clemson accounts, which adjunct faculty may not check often, so they may not be aware of the arrival of this important e-mail.** 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.

GS2 Plan of Study

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 by the middle of a student's second semester for M.S. students and by the end of the third semester for Ph.D. students. After this date, registration for the next semester may be blocked by the Registrar until the Plan of Study has been filed. An updated Plan with the courses that have been taken is generally then filed before graduation. **Note the deadlines** for filing the final GS2 before graduation – these are generally an entire semester before the defense: <http://www.clemson.edu/graduate/students/deadlines.html>

Form: As with the Committee Selection, the “form” is available through the iRoar portal. Please follow the directions found on the [Graduate School's webpage](#).

Courses: Students should list courses (formal or research) to total 30 or 60 credits depending on the degree and past degrees. This coursework is decided between the student and their advisory committee.

The total is determined based on the following:

- **M.S. students need 30 credits:** 24 of which are formal course credits (at least 12 of them at the 800 level) and 6 research credits (BIOL or MICR 8910). Four (4) of the 12 course credits should come from BIOL 8120 (Seminar), and 4 credits should come from BIOL/MICR 8070 (the Reading Group course).
- **Ph.D. students coming in with a M.S. degree in hand need 30 credits:** at least 18 of which must be research (BIOL or MICR 9910) and at least 12 of which must be coursework (this requirement for coursework credits may change in 2018-19). Six (6) course credits should come from BIOL 8120 and 6 course credits should come from BIOL/MICR 8070, unless the M.S. degree was granted from Clemson and the student already has completed 4 credits of BIOL 8120 and BIOL/MICRO 8070. In that case, only as many credits of BIOL 8120 and BIOL/MICRO 8070 needed to complete 6 credits of each course for the entire time at Clemson (inclusive of the M.S. degree) are needed.
- **Ph.D. students coming in with only a B.S./B.A. degree need 60 credits:** at least 18 of which must be research (BIOL or MICR 9910); at least 12 of which should be formal course credits (e.g., courses, BIOL 8120, BIOL 8130, BIOL 8070, MICR 8070); and at least half of which are at the 800-level or above. Six (6) course credits should come from BIOL 8120 (Seminar) and 6 course credits should come from BIOL/MICR 8070 (the Reading Group course). No more than 60 credits need to be included in the Plan of Study.

Do not list courses completed in excess of 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 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.

VII. Procedure for Organizing Your Proposal Defense

Reserve a Seminar Room

Contact Teri Elliott (656-2416; tellt@clemson.edu) well in advance of the date you want to defend your proposal. Be sure to let her know you are scheduling a **proposal defense** and not a final defense. Let her know your defense date, time, and room preference(s). She can also help you choose a room. Some common rooms for public proposal defenses include the Jordan Room; 229 and 332 Long Hall; LSF 026, 142, and 242; BRC 100; and Poole E-142. Teri can reserve the Jordan Room and the Long Hall rooms directly. She can fill out the forms to request LSF (<https://www.clemson.edu/science/about/guidelines.html>) or BRC rooms (https://www.clemson.edu/cafls/employee_portal/room-reservation.html). She can also request P&A E-142, which has videoconferencing abilities, through Tracy Reynolds (tracyr@clemson.edu). If Teri is unavailable, email BiolSci@clemson.edu and someone will assist you.

A proposal defense is required for all M.S. and Ph.D. students, but a public proposal defense is only required for Ph.D. students. A public proposal defense is optional for M.S. students.

Written Proposal

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

Announce Your Public Proposal Defense

At least 10 days before a public proposal defense,

- You should email an announcement of your proposal defense with the flyer attached (see below) to your advisor, committee members, and Jay Lyn Martin (jaylyn@clemson.edu).
- The contents of the announcement should be **in the body of the email**. The contents include your name (the name of the person defending); what you are defending (proposal, M.S., Ph.D.); the title of your talk; the date, time, and location of the talk; and your advisor's name.
- You should include this information on a flyer in a separate attachment with the email as well. The flyer should contain the following information:
 - A brief description of your research or 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.
 - All the relevant information for people who might wish to attend such as your name, date, time, location, name of your advisor, etc.
 - An image related to your research (photo, graph, computer generated image, etc.) may also be provided.
- You should post your flyer on the Seminar Board near the main Biological Sciences Office and on various boards in Long and Jordan Halls and the LSF, if appropriate.

Use the Biological Sciences Proposal Defense Verification Form

- See [Appendix 2](#) (Proposal Verification Form) for official documentation of your defense.
- Fill in as much information as you can. Print.
- Take printed form with you to your defense.
- Get signatures of all committee members.
- Leave original with Jay Lyn Martin (144 Long or mailbox in 132 Long), so it can be placed in your file.

If you need assistance with teleconferencing:

See [Joe Bradford](#), one of the IT specialists for the College of Science, for assistance.

VIII. Procedure for Organizing Your Thesis or Dissertation Defense

The following outlines the steps in scheduling your defense, advertising your defense, filing the appropriate form with the Graduate School once you have successfully completed your defense, and filing the appropriate assessment form with the Department. See <http://www.clemson.edu/graduate/students/deadlines.html> for all deadlines *well in advance* of the semester you plan to defend. Note that you must be enrolled for at least one credit during the semester you plan to defend (usually BIOL or MICR 8910/9910, but can be anything) and that you have to apply for graduation (GS4) at the beginning of the semester in which you plan to defend.

If you can complete all of your requirements, including an accepted manuscript, by the last day of registration for classes for the coming semester, you will be cleared to graduate at the end of that semester without having to enroll in credit hours or pay tuition. Check with Enrolled Services (weartha@clemson.edu) for the exact deadline for each semester, and please notify them that you plan to delay your graduation.

For guidelines for formatting your dissertation or thesis, see:

<http://www.clemson.edu/graduate/students/theses-and-dissertations/index.html>.

Note that 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

Contact Teri Elliott (656-2416; tellt@clemson.edu) well in advance of the date you want to defend your proposal. Be sure to let her know you are scheduling a *final defense*. She can also help you choose a room. Some common rooms for public proposal defenses include the Jordan Room; 229 and 332 Long Hall; LSF 026, 142, and 242; BRC 100; and Poole E-142. Teri can reserve the Jordan Room and the Long Hall rooms directly. She can fill out the forms to request LSF (<https://www.clemson.edu/science/about/guidelines.html>) or BRC rooms (https://www.clemson.edu/cafls/employee_portal/room-reservation.html). She can also request P&A E-142, which has videoconferencing abilities, through Tracy Reynolds (tracyr@clemson.edu). If Teri is unavailable, email BiolSci@clemson.edu and someone will assist you.

Thesis or dissertation

Provide all members of your committee with your full thesis/dissertation **at least 14 days** before your defense. **Email the appropriate Graduate Program Coordinator stating that the document has been provided to the committee at this time.**

Announce Your Defense

At least 10 days before your defense, you need to fill out this form to alert the Graduate School of your defense: <http://www.clemson.edu/graduate/calendar/defense-form.html>.

At least 10 days before your defense, you must also send an email to your advisor, committee members, and Jay Lyn Martin (jaylyn@clemson.edu) announcing your defense. Jay Lyn will forward it to the faculty and graduate students. **The contents of the announcement should be in the body of the email.** The contents include your name (the name of the person defending); what you are defending (proposal, M.S., Ph.D.); the title of your talk; the date, time, and location of the talk; and your advisor's name. You should include this information on a flyer in a separate attachment with the email as well.

Additionally, the flyer should contain the following information:

- A brief description of your research or 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.
- All the relevant information for people who might wish to attend such as your name, date, time, location, name of your advisor, etc.
- An image related to your research (photo, graph, computer generated image, etc.) may also be provided.

You should also post your flyer on the Seminar Board near the main Biological Sciences Office and on various boards in Long Hall, Jordan Hall, and the Life Sciences Facility (if appropriate).

Use GS7M (M.S.) or GS7D (Ph.D.) Form

Go to <http://www.clemson.edu/graduate/students/forms.html> for up-to-date forms.

- Open the appropriate GS7M or GS7D form.
- Write or type in your information at the top and your committee members names in the appropriate spaces at the bottom. Save to your computer (it can be opened and edited in Adobe Acrobat).
- Take printed form with you to your defense.
- Get signatures of all committee members.
- Leave copy of the GS7 in Jay Lyn Martin's mailbox in 132 Long.
- Take signed original of GS7 to Enrolled Student Services, 104-D Sikes Hall.

Bring a copy of the rubrics for departmental assessment to the defense (Appendix [6](#), [7](#), [8](#), or [9](#) depending on MS/PhD and BioSci/Micro). The rubrics can be found at: <http://www.clemson.edu/science/departments/biosci/academics/graduate/resources.html>. The advisory committee will fill out the appropriate rubric form after the defense and give it to Jay Lyn Martin.

IX. Guide for Formatting Bound Copies of Theses/Dissertations

The Graduate School requires that all Master's theses and Doctoral dissertations be submitted in electronic format. Guidelines for electronic format of theses/dissertations can be found on the Graduate School [webpage](#). The official copy of your thesis/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 your thesis/dissertation document required by the Graduate School, the Microbiology and Biological Sciences graduate degree programs **require one (1) bound copy of your thesis/dissertation** paid for by the Department for the departmental library collection of theses/dissertations located in 229 Long Hall. A signature page from your 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.

The department will pay for up to two (2) copies (one for the program, one for the student) to be bound through the National Library Bindery Company of Georgia located in Roswell, Georgia (770-442-5490; 770-442-0183 FAX). **Please see or email Jay Lyn Martin (jaylyn@clemsun.edu) for instructions.** The student will have to pay if extra copies of the thesis/dissertation manuscript, high quality paper (e.g. 100% cotton), or color printing for figures are desired.

Binding usually takes 4 weeks after receipt of the manuscript thesis/dissertation document. Receipt of the bound copy for the Biological Sciences departmental library is expected by **no more than 8 weeks** following graduation.

Appendix 1. Plan of Study (GS2)

The Plan of Study is now completed online and involves selecting a committee first. Instructions can be found here: <http://www.clemson.edu/graduate/students/plan-of-study/index.html>.

A list of courses that a typical graduate student would take is on the next page.

Also see [Section VI](#) of this Graduate Student Guide for instructions specific to our graduate degree programs.

Typical MS student		Credits	Notes
Reading Group (BIOL/MICR 8070 or BCHM 8900)	4		Total course credits ≥ 24 (at least 12 at 8000+ level)
Seminar (BIOL 8120)	4		
GTA Colloquium (BIOL 8130)	1		
Other course (6000+)	3		
Other course (6000+)	3		
Other course (6000+)	3		
Other course (6000+)	3		
Other course (6000+)	3		
BIOL/MICR 8910	6	Minimum of 6 research credits	
Total Credits for MS	30	Minimum total of 30 credits	
Typical PhD student with MS from elsewhere		Credits	Notes
Reading Group (BIOL/MICR 8070 or BCHM 8900)	6		Total course credits ≥ 12 because of Reading Group and Seminar requirements
Seminar (BIOL 8120)	6		
GTA Colloquium (BIOL 8130)	1		
Other course (6000+)	3		
Other course (6000+)	3		
BIOL/MICR 9910	18	Minimum of 18 research credits	
Total Credits for PhD with MS	30	Minimum total of 30 credits	
Typical PhD student with MS from Clemson		Credits	Notes
Reading Group (BIOL/MICR 8070 or BCHM 8900)	2	Have already taken 4 during MS	Total course credits ≥ 12
Seminar (BIOL 8120)	2	Have already taken 4 during MS	
Other course (6000+)	3		
Other course (6000+)	3		
Other course (6000+)	3		
BIOL/MICR 9910	20	Minimum of 18 research credits	
Total Credits for PhD with MS from Clemson	30	Minimum total of 30 credits	
Typical PhD student without MS		Credits	Notes
Reading Group (BIOL/MICR 8070 or BCHM 8900)	6		Total course credits ≥ 12 because of Reading Group and Seminar requirements
Seminar (BIOL 8120)	6		
GTA Colloquium (BIOL 8130)	1		
Other course (6000+)	3		
Other course (6000+)	3		
Other course (6000+)	3		
BIOL/MICR 9910	28	Minimum of 18 research credits	
Total Credits for PhD without MS	60	Minimum total of 60 credits	

Appendix 2. Proposal Defense Verification Form

Department of Biological Sciences

To: Graduate Advisory Committee
Re: Completion of Proposal Defense

This is to verify that _____ has
successfully / unsuccessfully orally defended the proposal entitled:

_____ on _____.
(date of completion)

The written proposal has been accepted / not accepted by the Advisory Committee consisting of:

Printed Name:

Signature:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

In the event of either of the above being unsatisfactory, corrective action consisting of the following has been recommended for the student.

This action should be completed by: _____ (date)

_____ Student Signature _____ Major Advisor

Submit to Ms. Jay Lyn Martin (144 Long Hall).

Appendix 3. Ph.D. Comprehensive Exam Formats

Format 1. “Research Proposal Format” This exercise is intended to assure that the doctoral student who has successfully completed the majority of the coursework requirements has the ability to 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. The proposal can, however, be an extension of the student’s dissertation research and thus, be in the student’s same field of research as the dissertation project. For example, a student might write a proposal outlining a postdoctoral project that would be a follow-up study to the student’s dissertation research.

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 2 weeks to research the topics before presentation to the student’s advisory committee. A 1.5–2 page description containing background and specific aims for each topic should be delivered to the members of the committee several 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 4 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, experimental design and methods. Students will not solicit help from any faculty or other graduate students when writing this proposal.

Comprehensive Exam: Following submission of the research proposal to the advisory committee by the student, the committee will schedule the comprehensive examination at which 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 to be capable of applying basic information from his/her coursework and reading of the literature to answer questions related to the research proposal. In addition, the student will be expected to demonstrate a general knowledge of biology, physics, chemistry, biochemistry, mathematics, and, in particular, the area of “bioscience” in which he/she is being trained. At the end of the exam, the committee can recommend Pass/Rewrite/Remediation/Fail.

Pass: student should file GS5D with the Graduate School; once 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: committee will decide extent of the rewrite and time allotted

Remediation: nature determined by committee (i.e. additional course work, another comprehensive exam)

Fail: if the advisory committee deems that the material and the student’s preparation is of sufficiently poor quality so as to be considered a “fail”, then several options may be

recommended by the committee. These recommendations include but are not limited to: choice of another topic and probationary period or recommendation for dismissal from program. All of 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. A second failure of any part of the exam terminates 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 the purpose of 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 his/her 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 his/her 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: student should file the GS5D with the Graduate School; once 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: committee will decide extent of the rewrite and time allotted for rewriting answers to written exam questions.

Remediation: nature determined by committee (i.e. additional course work, another comprehensive exam)

Fail: if the advisory committee deems that the material and the student’s preparation is of sufficiently poor quality so as to be considered a “fail”, then several options may be recommended by the committee. These recommendations include but are not limited to: choice of another attempt at written and oral examinations or recommendation for dismissal from

program. All of 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. A second failure of any part of the exam terminates the student from the Ph.D. program.

Appendix 4. Rubrics for Assessing SLOs – Biological Sciences – PhD Comprehensive Exam

Name: _____
Academic Year (e.g. 2018-19): _____

Committee chair: Return this form to Ms. Jay Lyn Martin in 144 Long Hall.

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

	Exceeds expectations	Meets expectations	Below expectations	Unacceptable
Demonstrates extensive knowledge of general principles and theories in biology				
Demonstrates extensive knowledge of particular subdiscipline of study				

Appendix 5. Rubrics for Assessing SLOs – Microbiology – PhD Comprehensive Exam

Name: _____

Academic Year (e.g. 2018-19): _____

Committee chair: Return this form to Ms. Jay Lyn Martin in 144 Long Hall.

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

	Exceeds expectations	Meets expectations	Below expectations	Unacceptable
Demonstrates extensive knowledge of general principles and theories in biology				
Demonstrates extensive knowledge of particular subdiscipline of study				

Appendix 6. Rubrics for Assessing SLOs – Bio Sciences – MS Thesis presentation and defense

Name: _____

Academic Year (e.g. 2018-19): _____

Committee chair: Return this form to Ms. Jay Lyn Martin in 144 Long Hall.

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

	Exceeds expectations	Meets expectations	Below expectations	Unacceptable
Demonstrates adequate knowledge of general principles and theories in biology				
Demonstrates adequate knowledge of particular subdiscipline of study				

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

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

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

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

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

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

Appendix 7. Rubrics for Assessing SLOs – Microbiology – MS - Thesis presentation and defense

Name: _____

Academic Year (e.g. 2018-19): _____

Committee chair: Return this form to Ms. Jay Lyn Martin in 144 Long Hall.

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

	Exceeds expectations	Meets expectations	Below expectations	Unacceptable
Demonstrates adequate knowledge of general principles and theories in microbiology.				
Demonstrates adequate knowledge of particular subdiscipline of study				

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

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

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

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

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

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

Appendix 8. Rubrics for Assessing SLOs – Biological Sciences – PhD Dissertation and Defense

Name: _____

Academic Year (e.g. 2018-19): _____

Committee chair: Return this form to Ms. Jay Lyn Martin in 144 Long Hall.

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

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

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

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

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

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

Appendix 9. Rubrics for Assessing SLOs – Microbiology – PhD Dissertation and Defense

Name: _____

Academic Year (e.g. 2018-19): _____

Committee chair: Return this form to Ms. Jay Lyn Martin in 144 Long Hall.

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

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

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

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

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

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

Appendix 10. Guide for New Students

Disclaimer: All the expenses mentioned in this document should be considered as guidelines; the actual costs or prices may differ.

- 1) Most GTA and some GRA assistantships are 9-month appointments, and the annual salary is paid in bimonthly (twice a month) equal installments between the end of August and mid-May each year.
 - a. Students need to set aside money during these 9-months to be able to pay for housing, food, etc. during the 3 months over the summer that they are not paid. To determine how much you should set aside per paycheck next year to make it through next summer, calculate $[(\text{annual salary}/18) - (\text{annual salary}/24)]$. For students receiving \$22,000 per year, this equates to \$306 per paycheck.
 - b. Over the summer, graduate students do not need to sign up for course/research credits. However, without being registered, students will have to purchase a Fike membership at the Service Center for \$15 per summer session (\$30 for the entire summer) if they wish to use the campus recreation facilities.
 - c. Over the summer, students will also not have access to the Redfern Health Center. Students can pay a \$15 co-pay for each office visit or a \$50 fee for each summer session. If you anticipate that a visit will be your only visit or that you would at most be there for a total of 3 visits (\$45), then the \$15 co-pay would be the least expensive option for you. If you anticipate that you're going to be returning and will have a total of 4 or more visits (\$60+), then the \$50 fee would be the best option. Contact Vicki Metz to pay the summer fee: svickie@clemson.edu, 656-2049.
- 2) **Fees:** Each semester, there are various fees that each student must pay that include access to the health center, gymnasium (Fike), and software. For Fall 2019 and Spring 2020, the amount will be \$1144 for students on an assistantship. Health insurance is not included in these fees and must be purchased separately (see below). Paying for fees with a credit card (US or international) will incur an additional cost.

International students can also bring money in a Forex Card (which is issued by several banks for international travel, and acts as a debit card), international credit card issued by a bank in their home country, or traveler's checks. After a bank account is opened (see below) and these checks are deposited, the bank will provide a checkbook, from which you can write a check to the University for the fees.

- 3) **Opening a bank account:** Opening a bank account is easy. It is advisable to open an account in banks that have a national and international presence such as Bank of America, Wachovia, BB&T – all which have branches in Clemson. It is advantageous to open bank accounts in such banks because, if you travel around the country, you can find their branches and ATMs. Also, if you need to send or receive money from your home, it is easier to deal with banks that have international banking experience. You can open an account with relative ease. The banks will need to see your passport, I-20, and student ID. Students should inform the bank manager/officer that their checking account will be a salaried account.
- 4) **Housing:** A wide choice of housing exists for students as Clemson is a university town.

Most of the international students don't buy a car within their first semester at Clemson due to costs and not having a U.S driving permit. It is convenient to stay near campus either at a walking distance or near bus routes. The City of Clemson offers a free bus service (CAT bus) to everyone. Buses run on designated routes from early morning to nearly dawn. There are many apartment complexes that are couple of steps from the nearest bus stop.

Apartment costs vary depending on locality and number of bedrooms. But as a general range you can find a single bedroom apartment or a studio apartment from \$350-450 per month. Utilities such as water and electric bills are paid separately. Apartments from two to four bedrooms with living room, kitchen and a washer and dryer with 1.5 to 2 bathrooms can cost from \$550-700+ respectively. Most of the apartments are furnished with beds and sofas, and microwaves. You will need to set up the kitchen and buy things like blenders, utensils, etc. You can find roommates once you arrive here and share the apartment costs. The property managing companies that maintain the apartments take a full month of rent as deposit. The deposit is also shared between the roommates. The utility companies (water and electric) also take deposits for the connections, which are also shared by the roommates. Many property management companies allow students to sign a lease only if they have a Social Security Number. Otherwise, an extra deposit may have to be paid. It is advisable to find an established student who is looking for a new roommate.

The Biological Sciences Graduate Student Association (BSGSA) has created a housing guide: <https://sites.google.com/site/clemsonbsgsahousingguide/>. In addition, many of the international student organizations, such as the Clemson Indian student association (CISA) (<https://www.facebook.com/groups/qacisa/>), have online groups where you can find roommates before coming to Clemson.

There are four major property managing companies from whom you can rent apartments. Contact information for them is as follows.

- Burton Properties (Heritage Pointe, Heritage at Riverwood, Heritage Hills)

<http://www.clemsonapartments.com/>

- Advantage Property Management Company, downtown Clemson. <http://apmclemson.com/>

- Carolina Real Estate, College Avenue. <http://www.carolina-realestate.com/>

- 5) **Cell phone:** Clemson University has contracts with various cell phone companies and students can get a cell phone without paying any deposits. The cell phone service costs around \$40-50 per month. The phones are provided free or at a discount if a one-year contract is signed. Students can purchase an international calling card online when they have activated their cell phone. These calling cards help to make cheap phone calls. One example is <http://www.indiald.com/>.
- 6) **Cable and internet:** You can get satellite cable from either Dish TV (<http://www.dishnetwork.com>) or DirecTV (<http://www.directv.com>). The cost ranges from \$50-100 a month. You aren't required to pay for installations or equipment purchase. Alternatively, you can get cable, which will cost about the same. You can get a cable internet plan from Northland Cable (<http://www.northlandcabletv.com/>) or AT&T U-verse (www.att.com/U-verse).

- 7) **Grocery shopping:** The Clemson Area Transit (CAT; <http://www.catbus.com/>) buses go to a couple of major supermarkets such as Ingles and Walmart. So, grocery shopping is easy even if you don't have a car. The groceries at the supermarkets aren't expensive, so it is cheaper and healthier to cook your own meals when you are on a budget. If you decide to cook on your own, your grocery budget shouldn't exceed more than \$150-200 a month. For international /Asian/Indian groceries for basmati rice, spices, etc., students travel to Greenville (nearest) or Atlanta. Students can travel with other students who have a car or even give a list to someone who is going to the store. An on-campus group called Friends of Internationals organizes a trip to the Asian market in Atlanta once every semester. <https://www.facebook.com/groups/FriendsOfInternationals.Clemson/>
- 8) **Getting a driver's license:** If you drive a car in your home country and if you are planning to buy a car here, get a driver's license from your home country and also an international driving permit from your home country. If you have a driver's license from your home country, you will not be required to get a beginner's permit here. You can directly take the driver's license test, and if you pass both the computer and driving exams, you will get a license.
- 9) **Health insurance:** All students are required to get health insurance. It is highly suggested to buy health insurance through Clemson. For international students, when you are traveling from your home country to the USA, it is advisable to get short-term travel insurance so you will be covered until the time your health insurance coverage starts at Clemson University. The Graduate School subsidizes the cost of health insurance. See <http://www.clemson.edu/cfo/student-financials/tuition-fees/index.html> and <http://www.clemson.edu/campus-life/campus-services/redfern/insurance/faq.html>.
- 10) **Enterprise CarShare:** Don't have a car? No problem. You can rent a car by the hour, on campus. Follow the link to get signed up for this car-sharing program. The vehicles available include hybrids and low emission vehicles. <https://www.enterprise.com/en/car-rental/locations/us/sc/clemson-university-26cu.html>
- 11) **What to bring:** CISA has a list of what to bring that may be helpful to Indian and other international students. <http://cu-cisa.org/> Books are expensive in the US, so it may be useful to bring textbooks and other reference materials from your home country. The library has basic books such as basic molecular biology or biochemistry textbooks, but it does not have multiple copies of each book.

Appendix 11. Resources for Graduate Students with Special Needs

For graduate student teaching issues:

Access and Equity (ADA)

<http://www.clemson.edu/campus-life/campus-services/access/american-disabilities/>

110 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 graduate student research and coursework:

Student Accessibility Services (SAS)

<http://www.clemson.edu/academics/studentaccess/student-resources.html>

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)

For graduate students who struggle with executive functioning:

Academic Success Center

<http://www.clemson.edu/asc/>

864-656-6452

What to do:

Set up meeting with Academic Coach, if necessary. An academic coach can help with difficulties with executive functioning: social skills, self-direction, self-awareness, etc.

Appendix 12. Contact Information for Departmental and University Staff and Their Duties Related to Graduate Students

See a complete list of the entire Biological Sciences staff in a descriptive 'who does what' format: <https://docs.google.com/document/d/17g20JT-97C72vGHvTIGxxtseGsFLLwEnoIG8whSP1EU/edit#>

Carla Brewer (138 Long Hall; cjdunca@clemsun.edu, 656-0854): Registration Coordinator (Overrides for signing up for courses)

Dixie Damrel (Campbell Museum; ddamrel@clemsun.edu, 656-7234): Herbarium Curator

Teri Elliott (132 Long Hall; tellt@clemsun.edu, 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, printing posters on the plotter)

Melissa Fuentes (138 Long Hall; fuentes2@clemsun.edu, 656-3456): Vertebrate Collection Curator

Jay Lyn Martin (144 Long Hall; jaylyn@clemsun.edu, 656-3587): Student Services Program Coordinator for Graduate Studies (**All graduate-student related questions**, including payroll and thesis/dissertation binding)

Mike Moore (235 Long; mmoore@clemsun.edu, 656-6273): Departmental Facility Manager (General maintenance and repair, ethanol stockroom, radiation badges, service contract issues)

Nancy Brown (temporary, 132B Long Hall; nbrown4@clemsun.edu, 656-3057): Administrative Assistant to Department Chair (Scheduling meetings with Chair; hiring undergraduate student workers)

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

Robert Robinson (140 Long Hall; rrobin9@clemsun.edu, 656-2330): Departmental Accountant (Expense accounting, travel forms)

Any general questions about the Biological Sciences program, contact: BiolGrad@clemsun.edu.

Any general questions about the Microbiology program, contact: MicroGrad@clemsun.edu.

Any general questions about the Department, contact: BiolSci@clemsun.edu.