Welcome to the Graduate Programs in the Department of Biological Sciences

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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.
Graduate Student Guide  
2013-14  
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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 Announcements. It is important to note that these Guidelines do not replace the general Graduate School regulations as specified in the Clemson University Graduate School Announcements. Graduate students are expected to review a copy of the Graduate Announcements and familiarize themselves with all relevant sections. The Graduate Announcements document can be found on the Graduate School Website. 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 Announcements set 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 Announcements.

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 (Form GS2). 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 (Form GS2).

3. **Graduate Programs Coordinator**: The Graduate Programs Coordinator chairs the Graduate Admissions/Advisory Committee (GAC), 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. Jeremy Tzeng (Fall 2013) and Dr. Saara DeWalt (Spring 2014)**

4. **Graduate Program Coordinator for Biological Sciences**: The BioSci Program Coordinator coordinates graduate admissions and current graduate students in the M.S. and Ph.D. degree programs in Biological Sciences. **Biological Sciences Graduate Program Coordinator: Dr. Lisa Bain (Fall 2013) and Dr. Saara DeWalt (Spring 2014)**

5. **Graduate Program Coordinator for Microbiology**: The Microbiology Program Coordinator coordinates graduate admissions and current graduate students in the M.S. and Ph.D. degree programs in Microbiology. **2013-2014 Microbiology Graduate Program Coordinator: Dr. Jeremy Tzeng**

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. **2013-2014 GAC Members: Dr. Christina Wells (BioSci), Dr. Richard Blob (BioSci), Dr. Lisa Bain (ENTOX/BioSci), Dr. Barbara Campbell (Micro), Dr. Tamara McNealy (Micro)**

7. **Dean for the College of Agriculture, Forestry and Life Sciences**: Administers teaching activities and faculty responsibilities in the College, administers College scholarships and fellowships, and approves all graduate student plans of study in the Program (Form GS2). **Dr. Thomas Scott**
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. **Dr. Karen Burg**

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

A. **Common Components to Ph.D. and M.S. Programs in Biological Sciences and Microbiology**

**Graduate school policies and procedures**

The final authority resides with the Graduate School. Their policies and procedures can be found at [http://gradspace.editme.com/academicRegulationsIndex](http://gradspace.editme.com/academicRegulationsIndex).

**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. 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 at [https://casauth.clemson.edu/](https://casauth.clemson.edu/). The Graduate Student Catalog can be found at [http://www.registrar.clemson.edu/html/catalogGrad.htm](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 2013-2014, the seminar will be held on Fridays from 2:30-3:30 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; 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. **2013-2014 Seminar Coordinator: Charlie Wei** ([ywei@clemson.edu](mailto:ywei@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 3 years; M.S. students for their first two years. 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 early signs of students having difficulty. 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 students 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 at http://gradspace.editme.com/academicRegulationsIndex

Ph.D. Program Requirements

The Doctoral Program will involve:

- Advisory Committee Selection
- Preparing a Plan of Study (Filing GS2, Appendix 1)
- Dissertation Proposal Preparation and Defense (Proposal Defense Verification Form, Appendix 3)
- Coursework including Seminar (BIOL 8120) and Reading Group (BIOL/MICR 8070)
- Comprehensive Exam (Filing GS5D - Appendix 4)
- Research and Dissertation
- Dissertation Defense (Filing GS7D, Appendix 10)
- Filing Annual Progress Reports (APR)

Each of these requirements is discussed in more detail below.

Ph.D. Advisory Committee Selection

The advisory committee must be composed of at least four faculty members, including the student’s advisor, who are willing and able to provide assistance and guidance on the student’s project. The majority of the committee, including the major advisor, must be composed of faculty who hold full-time, tenure-track positions at Clemson University. For committees of four or five members, at least three must be faculty who hold full-time, tenure-track positions at Clemson University. Either the major advisor or at least half of the committee must have majority faculty appointments in the Department of Biological Sciences.

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 student or a committee member may request a change in committee membership. 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 listed on the Form GS2 will require submission of a new form and approval by all committee members and appropriate administrators.

**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 (filing GS2).
- 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 (GS2) 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. Starting in 2013-14, 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 (filing GS2) for approval by the Graduate School by the end of the third semester. The GS2 must reflect the required 60 credit hours necessary for graduation. See Section VII for instructions on filling out and filing the GS2.

All incoming Microbiology students are required to take MICR 8020, Microbiological Techniques, which covers analytical and experimental procedures used in microbiology including techniques for studying cytology, physiology and metabolism. Requests for exemption from this course must be directed to the Graduate Program Coordinator for Microbiology (Dr. Tzeng, tzuenrt@clemson.edu). A previous graduate-level course in the subject or significant research/industrial experience may be considered as sufficient cause for exemption.

**Seminar enrollment and attendance:** Ph.D. students will enroll in BIOL 8120 (1 credit per semester; Pass/Fail) each semester of their first three years. Beyond the third year, enrollment is optional, but attendance is mandatory.

**Seminar Presentation:** Ph.D. students will conduct at least one seminar per year. The seminar may be at an official conference, a seminar to the department, or a research report/update to their committee. This presentation should be annotated on the annual progress report.
**Reading Group:** As noted in Section A, enrollment in a reading group course (BIOL or MICR 807; 1 credit per semester; Pass/Fail) is required for the first 6 semesters of the graduate degree. Beyond the third year, enrollment and participation are encouraged but not mandatory.

**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 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 VIII 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 (Appendix 4) 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. The Graduate School requires that satisfactory completion of the comprehensive examination must occur at least six months prior to the date of graduation.

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 5/6. The advisor will turn in the form after the comprehensive exams to 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 course work 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 IX for scheduling the defense. The dissertation must be provided to the committee at least 14 days before the defense.

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 (Appendix 10) 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 11/12. The advisor will turn in the form after the defense to 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 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.

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. candidates. The current salary for a 9-month appointment (no teaching in summer) is $18,000 for Ph.D. students. Annual GTA stipends may be supplemented by Faculty Advisors’ grant funds.

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 $18,000 – $25,000 depending upon tenure of student (years in program). 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 the GSA site, [http://www.grad.clemson.edu/fellowships.php](http://www.grad.clemson.edu/fellowships.php).
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<tr>
<th>Requirement</th>
<th>Relevant Form</th>
<th>Deadline (deadline for students entering Fall 2013)</th>
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<tbody>
<tr>
<td>Advisory Committee Selection</td>
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<td>By end of Semester 3 (December 2014)</td>
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<tr>
<td>Plan of Study</td>
<td>GS2</td>
<td>By end of Semester 3 (December 2014)</td>
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<tr>
<td>Comprehensive Exam</td>
<td>GS5D</td>
<td>By end of Year 3 (May 2016)</td>
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<tr>
<td>Dissertation Submission / Defense</td>
<td>GS7D</td>
<td>No more than 5 years after filing GS5</td>
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<tr>
<td>Annual Progress Report (APR)</td>
<td>APR</td>
<td>Every year</td>
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<tr>
<td>Research Presentation</td>
<td>APR</td>
<td>Every year</td>
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<tr>
<td>Seminar Attendance (BIOL 8120)</td>
<td>APR</td>
<td>Must be enrolled in years 1-3. Must attend every year.</td>
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<tr>
<td>Reading Group Attendance (BIOL 807/MICR 807)</td>
<td>APR</td>
<td>Must be enrolled in years 1-3. Suggested attendance otherwise.</td>
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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 at [http://gradspace.editme.com/academicRegulationsIndex](http://gradspace.editme.com/academicRegulationsIndex)
**M.S. Program Requirements**

The Master’s Program will involve:

- Advisory Committee Selection
- Plan of Study (Filing GS2, Appendix 1)
- 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, Appendix 7)
- Filing Annual Progress Reports (APR)

**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 committee must be composed of at least three faculty members including the student’s advisor. The majority of the committee, including the major advisor, must be composed of faculty who hold full-time, tenure-track positions at Clemson University. For committees of three members, at least two must be faculty who hold full-time, tenure-track positions at Clemson University. Either the major advisor or at least half of the committee must have majority faculty appointments in the Department of Biological Sciences.

The student or a committee member may request a change in committee membership. 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 listed on the Form GS2 will require submission of a new form and approval by all committee members and appropriate administrators.

**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 (filing GS2).
- 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 course work to fulfill this requirement will be completed by the student and his/her advisory committee and submitted in the Plan of Study (filing GS2) for approval by the Graduate School no later than the middle of the second semester. The GS2 must reflect the
required 30 credit hours necessary for graduation. See Section VII for instructions on filing the GS2.

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

- Bacterial Physiology and Metabolism
- Molecular Genetics
- Pathogenic Microbiology
- Virology or Immunology
- Molecular Medicine
- Environmental Microbiology

Additionally, all incoming Microbiology students are required to take MICR 8020, Microbiological Techniques, which covers analytical and experimental procedures used in microbiology including techniques for studying cytology, physiology and metabolism. Requests for exemption from this course must be directed to the Graduate Program Coordinator for Microbiology (Dr. Tzeng, tzuenrt@clemson.edu). A previous graduate-level course in the subject or significant research/industrial experience may be considered as sufficient cause for exemption.

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. The seminar may be at an official conference, a seminar to the department, or a research report/update to their committee. This presentation should be noted on the annual progress report.

Reading group: As noted in Section A, M.S. student 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.

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. 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 IX for scheduling the thesis defense. The thesis must be provided to the committee at least 14 days before the defense.

This final Oral Exam consists of general questions covering the discipline and mastery of skills and questions challenging the thesis. Students should prepare for the general questions through review of their 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 (Appendix 7) 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 the form after the defense to 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. The current salary for a 9-month appointment (no teaching in summer) is $16,000 for M.S. students. Annual GTA stipends may be supplemented by Faculty Advisors’ grant funds.

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 $16,000 – $20,000 depending tenure of student (years in program). 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 the GSA site, http://www.grad.clemson.edu/fellowships.php.
**M.S. Program Timetable**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Relevant Form</th>
<th>Deadline (deadline for students entering Fall 2013)</th>
</tr>
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<tbody>
<tr>
<td>Advisory Committee Selection</td>
<td></td>
<td>By end of Semester 1 (December 2013)</td>
</tr>
<tr>
<td>Plan of Study</td>
<td>GS2</td>
<td>By end of Semester 2 (May 2014)</td>
</tr>
<tr>
<td>Thesis Proposal and Defense</td>
<td>Proposal Defense</td>
<td>By end of Semester 3 (December 2014)</td>
</tr>
<tr>
<td></td>
<td>Verification</td>
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</tr>
<tr>
<td>Thesis Submission / Defense</td>
<td>GS7M</td>
<td>By end of Year 3 (May 2016)</td>
</tr>
<tr>
<td>Annual Progress Report (APR)</td>
<td>APR</td>
<td>Every year</td>
</tr>
<tr>
<td>Research Presentation</td>
<td>APR</td>
<td>Every year</td>
</tr>
<tr>
<td>Seminar Attendance (BIOL 8120)</td>
<td>APR</td>
<td>Must be enrolled in years 1 and 2. Must attend every semester.</td>
</tr>
<tr>
<td>Reading Group Attendance (BIOL 8070 or MICR 8070)</td>
<td>APR</td>
<td>Must be enrolled in years 1 and 2. Suggested attendance otherwise.</td>
</tr>
</tbody>
</table>

**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’ masters 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 master’s or an ‘en route’ master’s degree. The en route master’s is not is an avenue for students who seek only a master’s degree and who do not plan to pursue the doctoral degree. The en route master’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’ master’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 Master’s oral exam (at the Master’s thesis defense) before being awarded the ‘en route’ masters.

**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. (See Section C.)

**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 the Graduate Advisory Committee. 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 after the student has successfully completed 4 semesters in the M.S. program, but under exceptional circumstances, a bypass request can be made and approved after only 2 semesters.

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 6 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.

b) Following discussions between the student and his or her advisory committee, the student will submit a short (1-2 pages) written request to the Graduate Advisory Committee 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 reprints of published papers or published abstracts, completed manuscripts, or a list of other formal presentations can be included with the request.

c) The Graduate Advisory Committee will either approve or disapprove the request, and in the case of approval, the student will schedule and present a research seminar open to the department. 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 or her advisory committee.

d) Following the seminar presentation, the student’s advisory committee will submit a written recommendation to the Graduate Advisory Committee as to whether the student is prepared to move directly to the Ph.D. Final approval of the application to bypass the M.S. degree will then be made by the Graduate Advisory Committee.

e) If the student is approved to switch to the Ph.D., the Graduate Programs Coordinator will notify the Graduate School. If the Plan of Study (GS2) has already been filed with the graduate school, it must be re-filed reflecting the student’s new status in the Ph.D. program and the new faculty advisory committee members to meet the minimum of 4 advisory committee members for Ph.D. students. Students admitted to the Ph.D. program in this way are expected to fulfill all current Ph.D. requirements.

f) Students who use this option are not awarded the M.S. degree.

F. M.S. Non-thesis Option

The non-thesis option of the M.S. is designed primarily for K-12 teachers and others interested in biological sciences education. Candidates must complete a total of 30 semester 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 traditional M.S. 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.
III. Starting Graduate School

A. New Student Employee Enrollment

1. Once you arrive on campus you will need to go see Jay Lyn Martin (144 Long). Please bring with you:

   - A copy of your social security card
   - A copy of your driver’s license
   - One additional form of identification
   - A blank, voided check, a deposit slip, or your bank routing and account # to set up your direct deposit of your paycheck

2. You will need to complete the following forms before your employment begins:

   - a personnel data sheet
   - a I-9 form for employment verification
   - a W-2 form for tax withholding.

(International students will give their I-9 and W-2 to Pablo Unda in Human Resources.)

B. International Student Employee Enrollment

1. International student employment on campus requires the following before approval will be given approval to start work. Once you arrive on campus, go immediately to the International Office in E302 Martin Hall. After leaving the International Office, next go see Pablo Unda or Mack Howard in Human Resources. After seeing both of them, see Jay Lyn Martin in 144 Long Hall.

   When you go to the International Office and Human Resources, take with you:

   - A valid form I-20 or form DS 2019 issued for study at Clemson University
   - A current (unexpired) foreign passport with attached I-94 card
   - A U.S. visa
   - A signed social security card

   If you do not have a US social security card and you do have an F1 visa, then you must also obtain a completed “Employment Verification Letter” from the department in which you will work.

2. You must also complete the international employment forms as directed by the International Office and Human Resources:

   - Print out all the forms
   - Sign and date all the forms
3. Schedule an appointment time in E303 Martin Hall for a review of original documentation and all completed employment and tax forms. Contact the Office of International Affairs, (656-3614 or oia@clemson.edu), to make an appointment. Contact Pablo Unda (656-5591 or pund@clemson.edu) to make an appointment in Human Resources. This must be done before you will be allowed to work.

4. After you have been in the U.S. for 10 days, you should go to the Social Security Office in Anderson to apply for a Social Security card. You will be given a letter but not a card the day you apply. Give the letter to Pablo Unda or Mack Howard in Human Resources as soon as you return.

C. Payroll, Fees, and Benefits Information

Payroll
Graduate teaching (GTAs) and research (GRAs) assistants receive semimonthly payments throughout the year. Most appointments are 9-month annual appointments beginning August 15 of each year to May 15. 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 Fall 2013, the amount is $1041 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. All international graduate students are required to have health insurance. It may be purchased through Clemson University or though other insurance policies that meet the University requirements. The Graduate School subsidizes the cost of health insurance. Because of this subsidy, for 2013-14, the approximate cost of health insurance will be approximately $241 for the entire year. See http://www.clemson.edu/cfo/student-
Effective April 1, 2009 a new medical clearance policy is in effect. The immunization requirements have changed to include a verification process. All students are now required to:

1. Complete the online medical clearance form
2. Submit official documentation to Redfern to substantiate the immunization entries

**D. 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 lunch with current graduate students. If you are unable to attend orientation, you must contact the appropriate Graduate Program Coordinator (Biological Sciences: Saara DeWalt, saarad@clemson.edu or Microbiology: Jeremy Tzeng, tzuenrt@clemson.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 [http://tinyurl.com/ClemsonBSGSA](http://tinyurl.com/ClemsonBSGSA).

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@clemson.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/](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: [http://www.grad.clemson.edu/pegas/](http://www.grad.clemson.edu/pegas/)

**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.

Departmental computers located in the graduate student office may be reformatted or files may be erased at any time. You are responsible for maintaining all of your files, including backups, on your “U” drive space or in some other format.

Students can have personal computers set up with appropriate email software and wireless setup by taking the computer to CCIT or by contacting the departmental computing specialist, Teela Roche ([troche@clemson.edu](mailto:troche@clemson.edu)).

*Poster printing.* The departmental contact for poster printing is Ms. Sally Brock ([sallyb@clemson.edu](mailto:sallyb@clemson.edu)).

**C. Office Information**

Graduate students are normally assigned a desk in their research lab. If required, desks and filing cabinet space is also available in the graduate student office in 230/234 Long Hall. Contact Sandy Kawano ([skawano@clemson.edu](mailto:skawano@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 (Long 132). 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 131 Long Hall. Your faculty advisor must provide an account number to use the photocopy machines. Personal copying may not be done on the departmental copier. 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.

Audio-Visual Equipment and Media. Laptop computers and LCD projection systems are available from Sally Brock (sallyb@clemson.edu). Units should be reserved in advance and signed out just prior to use. Immediate return is expected.

Sending Express Shipments. To send an express package, contact Barbara Piekutowski in the departmental office. You must provide an account number to pay for the shipment (available from your faculty advisor).

Departmental Vehicles. The department maintains two trucks and a van 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 Elliot (telltt@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/campus-services/parking/index.html.
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.

*Real-time PCR instruments.* A Roche Light Cycler for real-time PCR (in 96 and 384 well formats) is available on a fee for use basis. For more information contact Dr. Tamara McNealy (tmcneal@clemson.edu).

*Microscopy, Imaging, Flow Cytometry.* The Light Imaging Facility is located Suite 030 of the Life Sciences Facility. Equipment available in this facility includes the following:

1. Leica TCS SP8X Multiphoton/Spectral Confocal  
2. Leica M80 Stereomicroscope  
3. Leica DM 750P Polarized Light Microscope  
4. Nikon Eclipse Ti  
5. Nikon AZ100 Multizoom  
6. Nikon LV-UDM  
7. Zeiss LSM 510 Confocal Microscope  
8. CytoViva Widefield Hyperspectral Imaging System  
9. BD Influx FACS Flow Cytometer  
10. Guava EasyCyte HT

More information regarding the use of this equipment can be obtained from Dr. Terri Bruce (terri@clemson.edu). See [http://www.clemson.edu/cafls/lif/index.html](http://www.clemson.edu/cafls/lif/index.html) for more details.

**University Facilities**
Specialized fee-based campus facilities are also available to all departmental researchers. These include animal facilities, greenhouse 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/electronmicroscope/index.html or by contacting Dr. Joan Hudson (joanhh@clemson.edu)

Clemson University Genomics Institute (CUGI). Located in the Biosystems Research Complex. Resources include the following:

- high quality BAC libraries
- cDNA libraries
- Robotics (colony picking, re-arraying, colony filter arrays, library storage and clone distribution)
- Sequencing (PCR, cDNA, shotgun, BAC-end)
- Physical mapping (BAC fingerprinting, marker hybridization)
- Proteomics and lipidomics (mass spectroscopy, modification, hydrophobicity and shotgun proteomics)
- Functional genomics (labeling and hybridization, chip reading and statistical analyses)

Contact and detailed service information can be found at http://www.genome.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 Knight Cox, Forest Manager, 266B Lehotsky Hall, kcox@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. Catherine Cox (cweele@clemson.edu, 656-3610) is the greenhouse manager for the Jordan Hall greenhouse. This greenhouse is mainly for propagating plants for teaching purposes. See http://www.clemson.edu/public/brc/greenhouse/index.html 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 Mr. Stanlee Miller (smml@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. Dixie Z. Damrel (ddamrel@clemson.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@clemson.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@clemson.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 Environmental Health and Safety (EHS) web site: http://ehs.clemson.edu/environment/index.html.

*Appropriate training must be completed prior to beginning laboratory or fieldwork.*

EHS 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 Jackie Van Strien (vanj@clemson.edu, 656-0854; see above), the departmental chemical hygiene and safety contact person for any issues related to chemical hygiene in Biological Sciences.

**G. Travel Forms**

Forms requesting permission to travel or to report expenses for in-state, out-of-state, and foreign travel are available on the Department’s website at http://www.clemson.edu/cafls/employee_portal/index.html. Click “Resources for Faculty & Staff” on the left to retrieve the forms. Make sure to check with Ms. Rita McConnell (656-2330, chastai@clemson.edu) for rules and regulations for booking travel or registering for conferences.
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 also be found on the Graduate School website and these should be used for official copies. See http://www.grad.clemson.edu/forms/forms_current.php for forms for current students. See http://www.grad.clemson.edu/forms/forms_graduating.php for forms for graduating students. 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 (GS2) (Appendix 1). This form is to be filled out 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 on the official GS2 must be passed (grade of “B” or higher) prior to completion of the graduate degree, even if those courses are not part of the general degree requirements.

Results of the Comprehensive Ph.D. Exam Form (GS5D; Ph.D. Only) (Appendix 4). 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) (Appendix 7). 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) (Appendix 10). 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 Filing the GS2 Form

The purposes of the GS2 form are to document: a) the composition of a graduate student's committee and b) the plan for coursework upon which the student and committee have agreed.

1) **Deadlines**: A student should plan on filling out *two* GS2 forms during their degree. The first one is due by the middle of a student’s second semester for MS students and by the end of the third semester for PhD students. Registration for the next semester will be blocked by the Registrar until the form has been filed after this date. An updated form, with the final committee composition and the courses that have been taken, is generally then filed before graduation. **Note the deadlines** for filing the final GS2 before graduation – these are often an entire semester before the defense: [http://www.grad.clemson.edu/deadlines.php](http://www.grad.clemson.edu/deadlines.php)

2) **Form location**: Use the GS2 form that is *fillable* and can be found online at the Graduate School website under “Forms and Procedures” for “Current Students.” Handwritten forms are not accepted by the Graduate School. [http://www.grad.clemson.edu/forms/forms_current.php](http://www.grad.clemson.edu/forms/forms_current.php).

3) 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:

- **MS 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).

- **PhD students coming in with a MS degree in hand need 30 credits**: at least 18 of which must be research (BIOL or MICR 9910). Six (6) course credits should come from BIOL 8120 and 6 course credits should come from BIOL/MICR 8070.

- **PhD students coming in with only a BS/BA 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 should be listed on the GS2.

**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 and our graduate programs (i.e., the Biological Sciences Seminar and Reading Group courses), and research credits should be listed on the GS2.
All research credits (8910 or 9910) should be condensed into a single entry with the completed date approximately coincident with the anticipated date of graduation. Each course taken over multiple semesters (e.g. BIOL 8120, BIOL/MICR 8070) should also be condensed into single entries.

4) **Students should bring or email a draft of the GS2** to Dr. Jeremy Tzeng (tzuenrt@clemson.edu for Micro) or Dr. Lisa Bain (lbain@clemson.edu for BioSci Fall 2013) or Dr. Saara DeWalt (saarad@clemson.edu for BioSci Spring 2014) **BEFORE** obtaining their committee’s signatures to make sure that the requirements for course credits have been fulfilled and that the committee composition meets the requirements of the Graduate School and Department.

5) **The student should obtain committee signatures and give it back to Dr. Tzeng or Dr. DeWalt for signature.** The student will then pass it on for Dr. Bob Cohen to sign and then take it to Jay Lyn Martin for a copy to be made. The GS2 will then go on to Dean Scott for signature and finally will be processed in Sikes Hall in Enrolled Student Services.

VII. **Procedure for Organizing Your Proposal Defense**

**Reserve a Seminar Room**
Contact Barbara Piektowski (656-3057, piekb@clemson.edu), Jillian Danson (656-2328, danson@clemson.edu), or Teri Elliot (656-2416, tellt@clemson.edu) to reserve a room in Long Hall. Let her know the day and time your committee wants. Be sure to let her know it’s a **thesis proposal defense** and not a final thesis defense. The Jordan Room, 229 Long Hall, and 338 Long Hall are appropriate rooms for both the public and private portions of the defense.

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, Barbara Piektowski (piekb@clemson.edu), and Jay Lyn Martin (javlyn@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:
o 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.

o All the relevant information for people who might wish to attend such as your name, date, time, location, name of your advisor, etc.

o 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 LSB, if appropriate.

**Use the Biological Sciences Proposal Defense Verification Form**

- See Appendix 2 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 media:**

See Sally Brock (656-3604 or sallyb@clemson.edu) in 124 Long Hall.

**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.grad.clemson.edu/deadlines.php](http://www.grad.clemson.edu/deadlines.php) 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.

For guidelines for formatting your dissertation or thesis, see: [http://www.grad.clemson.edu/Manuscript/](http://www.grad.clemson.edu/Manuscript/).

**Reserve a Seminar Room**

Contact Barbara Piekutowski (656-3057, piekb@clemson.edu), Jillian Danson (656-2328, danson@clemson.edu), or Teri Elliot (656-2416, telllt@clemson.edu) to reserve a room in Long Hall. The Jordan Room or 229 Long Hall are appropriate rooms for both the public and private portions of the defense. Let her know the day and time your committee wants to schedule your seminar presentation and oral defense. Ph.D. candidates must pass the oral examination - the dissertation defense - at least three weeks prior to the commencement ceremony.

**Thesis or dissertation**

Provide all members of your committee with your full thesis/dissertation *at least 14 days* before your defense.
Announce Your Defense

At least 10 days before your defense, you should send email an announcement of your defense with a flyer (see below) to your advisor, committee members, Graduate School Dean Karen Burg (kburg@clemson.edu), Enrolled Student Services (weartha@clemson.edu), and Jay Lyn Martin (jaylyn@clemson.edu). 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.grad.clemson.edu/forms/forms_graduating.php](http://www.grad.clemson.edu/forms/forms_graduating.php) 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 8, 9, 11 or 12 depending on MS/PhD and BioSci/Micro). The rubrics can be found at: [http://www.clemson.edu/cafls/departments/biosci/graduates/Forms.html](http://www.clemson.edu/cafls/departments/biosci/graduates/Forms.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: [http://www.grad.clemson.edu/Mansucript/](http://www.grad.clemson.edu/Mansucript/). 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@clemson.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)

Go to [http://www.grad.clemson.edu/forms/forms_current.php](http://www.grad.clemson.edu/forms/forms_current.php) for the most current, fillable version of this form. See page 31 for instructions.

### GS2 - Plan of Study

<table>
<thead>
<tr>
<th>Last Name:</th>
<th>First Name:</th>
<th>Mi:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUID:</td>
<td>Degree Sought:</td>
<td>Major:</td>
<td>Minor:</td>
</tr>
</tbody>
</table>

If doctoral degree, does student have master's degree?  
- [ ] Yes  
- [ ] No

- [ ] Master's Non-Thesis, 0-7 required  
- [ ] Master's Non-Thesis, no 0-7 required  
- [ ] Other

The following undergraduate deficiencies, departmental and language requirements must be met prior to admission to candidacy:

### REQUIRED COURSES (GRADUATE LEVEL ONLY)

<table>
<thead>
<tr>
<th>Course Prefix and No. (ex: ENGL 638)</th>
<th>Title of Course as Listed in Catalog</th>
<th>Semester Credit Hrs</th>
<th>Date Completed or to be Completed</th>
</tr>
</thead>
</table>

**IMPORTANT: INITIAL BELOW AND CONTINUE ON TO THE NEXT PAGE OF THIS FORM.**

[Signature]

[Committee Chair]

[Co-Chair]

[Committee Member 1]

[Committee Member 2]

[Committee Member 3]
Appendix 1 continued. Plan of Study (GS2) - 2nd of 2 pages
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 GS5 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 GS5 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. Comprehensive Exam (GS5D)
Go to http://www.grad.clemson.edu/forms/forms_current.php for the most current, fillable version of this form.

GS5D - RESULTS OF THE DOCTORAL COMPREHENSIVE EXAM AND CANDIDACY FORM

*Date ____________________

TO THE DEAN OF THE GRADUATE SCHOOL:

This committee has given ___________________________ (Student's Name) ___________________________ (Student's CU ID Number) the comprehensive examination for the Doctor of Philosophy/Education degree with a major in ___________________________ and reports the results as follows:

☐ Passed: student is admitted to candidacy.*

☐ Failed

The examination was given over the dates ___________________________ to ___________________________.

If the result is "Failed," please indicate recommendation relative to a second comprehensive examination, if any.

__________________________________________________________________________

__________________________________________________________________________

Examinining Committee

<table>
<thead>
<tr>
<th>Typed name</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Chairperson</td>
<td>Chairperson</td>
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</tbody>
</table>

Return this form to Graduate Enrolled Services, 104D Sikes Hall.

*Student has five years from passage of the comprehensive examination to complete all requirements for the doctorate degree.

THE GRADUATE SCHOOL
E-100 Martin Hall, Box 34713, Clemson, SC 29634-5713
864.656.3195 FAX 864.656.5344

From GS5D
Rev. 85/11

41
Appendix 5. Rubrics for Assessing SLOs – Biological Sciences – PhD Comprehensive Exam

Academic Year (e.g. 2013-14)____________________

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:

<table>
<thead>
<tr>
<th></th>
<th>Exceeds expectations</th>
<th>Meets expectations</th>
<th>Below expectations</th>
<th>Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates extensive knowledge of general principles and theories in biology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates extensive knowledge of particular subdiscipline of study</td>
<td></td>
<td></td>
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</tbody>
</table>
Appendix 6. Rubrics for Assessing SLOs – Microbiology – PhD Comprehensive Exam

Academic Year (e.g. 2013-14)________________________

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:

<table>
<thead>
<tr>
<th></th>
<th>Exceeds expectations</th>
<th>Meets expectations</th>
<th>Below expectations</th>
<th>Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates extensive knowledge of general principles and theories in biology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates extensive knowledge of particular subdiscipline of study</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Appendix 7. MS Final Exam and Thesis Approval Form (GS7M)
Go to http://www.grad.clemson.edu/forms/forms_graduating.php for the most current version of this form.

GS7M - FINAL EXAM AND THESIS APPROVAL FORM

Date _________________________

TO THE DEAN OF THE GRADUATE SCHOOL:

This committee has given ________________ (Student’s Name) ___________ (CUID number) a final examination for the _______ (Degree: MS, MA, MEd, etc.) degree with a major in ____________________________
and reports the results as follows:

☐ PASSED final exam, no thesis required, and student has met all departmental requirements related to special projects, etc.

☐ PASSED final exam, thesis required, and the student’s committee has approved the manuscript.

☐ FAILED final exam. Please indicate recommendation relative to a second final examination, if any:

________________________________________________________________________________________

________________________________________________________________________________________

Examing Committee

This form must be signed by all committee members.

☐ Advisor Signature  OR  ☐ Co-Advisor Signature

☐ Advisor name (type or print)  OR  ☐ Co-Advisor name

☐ Co-Advisor

________________________________________________________________________________________

________________________________________________________________________________________

Return this form to: Enrolled Services, 104-D Skyles Hall, Clemson, SC 29634; 864.656.3339.
Appendix 8. Rubrics for Assessing SLOs – Biological Sciences – MS Thesis presentation and defense

Academic Year (e.g. 2013-14)_____________________
Committee chair: Return this form to Ms. Jay Lyn Martin in 144 Long Hall.

<table>
<thead>
<tr>
<th>SLO 1: Knowledge of principles and theories in biology as demonstrated in the thesis defense:</th>
<th>Exceeds expectations</th>
<th>Meets expectations</th>
<th>Below expectations</th>
<th>Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates adequate knowledge of general principles and theories in biology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates adequate knowledge of particular subdiscipline of study</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>SLO 2: Application of scientific methods in biology as evidenced in the written thesis:</th>
<th>Exceeds expectations</th>
<th>Meets expectations</th>
<th>Below expectations</th>
<th>Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>States the research problem clearly, providing motivation for undertaking the research</td>
<td></td>
<td></td>
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<tr>
<td>Demonstrates sound knowledge of literature in the area, and of prior work on the specific research problem</td>
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<tr>
<td>Shows a good understanding of how to use methods/tools effectively</td>
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<tr>
<td>Defends use of particular methods/tools clearly and logically</td>
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</table>

<table>
<thead>
<tr>
<th>SLO 3: Effective oral communication of research in biology as evidenced by the thesis presentation:</th>
<th>Exceeds expectations</th>
<th>Meets expectations</th>
<th>Below expectations</th>
<th>Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presents sufficient background information to justify the project</td>
<td></td>
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<td></td>
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<tr>
<td>Clearly presents the hypotheses tested</td>
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<tr>
<td>Clearly presents the experimental design and statistical/analytical tools used</td>
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<tr>
<td>Uses slides effectively to convey content</td>
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<tr>
<td>Provides an overall clearly conceived and designed MS thesis</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>SLO 4: Effective written communication of research in biology as evidenced by the written thesis:</th>
<th>Exceeds expectations</th>
<th>Meets expectations</th>
<th>Below expectations</th>
<th>Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>States the research problem clearly, providing motivation for the research</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Synthesizes peer-reviewed literature appropriate for research topic</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Clearly describes appropriate scientific and statistical methods/tools</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Presents results clearly and succinctly</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uses appropriate graphics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comes to conclusions that are supported by the results</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 9. Rubrics for Assessing SLOs – Microbiology – MS - Thesis presentation and defense

Academic Year (e.g. 2013-14)_____________________

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:**

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<td>Demonstrates adequate knowledge of particular subdiscipline of study</td>
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**SLO 2: Application of scientific methods in microbiology as evidenced by the written thesis:**

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

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

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Appendix 10. PhD Dissertation Defense and Dissertation Approval Form (GS7D)

Go to http://www.grad.clemson.edu/forms/forms_graduating.php for the most current version of this form.

GS7D – DISSERTATION DEFENSE AND APPROVAL FORM

Date __________________________

TO THE DEAN OF THE GRADUATE SCHOOL:

This committee has given ___________________________ (Student's Name) ___________________________ (CUID number)

a final examination for the ______ (Degree, PhD, EdD, etc.) degree with a major in ___________________________

and reports the results as follows:

☐ PASSED oral defense. dissertation required, and the student's committee has approved the manuscript.

☐ FAILED oral defense. Please indicate recommendation relative to a second oral defense, if any:

____________________________________________________________________

____________________________________________________________________

Exchanging Committee

This form must be signed by all committee members.

☐ Advisor Signature OR ☐ Co-Advisor Signature

☐ Advisor name (type or print) OR ☐ Co-Advisor name

☐ Co-Advisor

____________________________________________________________________

____________________________________________________________________

Return this form to: Enrolled Services, 104-D Sikes Hall, Clemson, SC 29634; 864.656.5139.
Appendix 11. Rubrics for Assessing SLOs – Biological Sciences – PhD Dissertation and Defense

Academic Year (e.g. 2013-14)________________________________________
Committee chair: Return this form to Ms. Jay Lyn Martin in 144 Long Hall.

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## Appendix 12. Rubrics for Assessing SLOs – Microbiology – PhD Dissertation and Defense

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

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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 [(annual salary/18) - (annual salary/24)]. For PhD students receiving $18,000 per year, this equates to $250 per paycheck. For MS students receiving $16,000 per year, this equates to $222 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 2013, the amount is $1041 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 of 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:** The majority of graduate students stay off campus. 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 $250-350 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 and ½ 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/](https://sites.google.com/site/clemsonbsgsahousingguide/). In addition, many of the international student organizations, such the Clemson Indian student association (CISA) ([https://www.facebook.com/groups/qacisa/](https://www.facebook.com/groups/qacisa/)), have online groups where you can find roommates before coming to Clemson. CISA also coordinates airport pick-ups and temporary housing for incoming students: [http://www.cisa.masterreef.com/incoming-students/airport-pickup/](http://www.cisa.masterreef.com/incoming-students/airport-pickup/).

There are four major property managing companies from whom you can rent apartments. Contact information for them is as follows. CISA maintains a more exhaustive list at [http://www.cisa.masterreef.com/incoming-students/housing/](http://www.cisa.masterreef.com/incoming-students/housing/). The BSGSA website (above) also has several listed.

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
6) **Cable and internet**: You can get satellite cable from either Dish TV ([http://www.dishnetwork.com](http://www.dishnetwork.com)) or DirecTV ([http://www.directv.com](http://www.directv.com)). The cost ranges from $40-70 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/](http://www.northlandcabletv.com/)) or AT&T U-verse ([www.att.com/U-verse](http://www.att.com/U-verse)).

7) **Grocery shopping**: The Clemson Area Transit (CAT; [http://www.catbus.com/](http://www.catbus.com/)) buses go to a couple of major supermarkets such as Ingles, Walmart and Bi-Lo. 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 $100-150 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/](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. Because of this subsidy, for 2013-14, the approximate cost of health insurance will be approximately $241 for the entire year. [http://www.clemson.edu/cfo/student-financials/tuition-fees/index.html](http://www.clemson.edu/cfo/student-financials/tuition-fees/index.html); [http://www.clemson.edu/campus-life/campus-services/redfern/insurance/faq.html](http://www.clemson.edu/campus-life/campus-services/redfern/insurance/faq.html)

10) **WeCar**: 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. [http://www.wecar.com/join-wecar/program-details/Clemson](http://www.wecar.com/join-wecar/program-details/Clemson)

11) **What to bring**: CISA has a list of what to bring that may be helpful to Indian and other international students. [http://www.cisa.masterreef.com/incoming-students/things-to-bring/](http://www.cisa.masterreef.com/incoming-students/things-to-bring/) Books are expensive in the US, so it may 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 14. Contact Information for Departmental and University Staff

Microbiology Teaching Lab Coordinator
John Abercrombie (Life Sciences Facility; ja@clemson.edu, 656-5431)

Introductory Biology Lab Coordinator
Rebecca Ackerman (334 Long Hall; arebecc@clemson.edu, 656-1996)

Departmental Media Specialist
Sally Brock (124 Long; sallyb@clemson.edu, 656-3604)
Graphic presentation help, poster printing, departmental property inventory, use of LCD projectors and departmental laptop computers.

Microscopy
Terri Bruce (Life Sciences Facility, terri@clemson.edu, 656-1264)

Greenhouse Manager
Catherine Cox (Jordan greenhouse; catwcox@hotmail.com, 656-3610)

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

Main Office Administrative Specialist
Jillian Danson (132 Long Hall; danson@clemson.edu, 656-2328)
Conference room scheduling; key checkouts for buildings, offices and laboratories; departmental Facebook page; departmental Web page; paper and supplies; food waivers; and departmental visitor parking permits.

Main Office Administrative Assistant
Teri Elliott (132 Long Hall; telltt@clemson.edu, 656-2416)
Scheduling use of the departmental vehicles, departmental visitor parking permits

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

Departmental Accountant
Rita McConnell (140 Long Hall; chastai@clemson.edu, 656-2330)
Expense accounting.

Vertebrate Collection Curator
Stanlee Miller (Campbell Museum; smml@clemson.edu, 656-3456)

Departmental Facility Manager
Mike Moore (235 Long; mmoore@clemson.edu, 656-6273)
General maintenance and repair, ethanol stockroom, radiation badges, service contract issues
Administrative Assistant to Department Chair
Barbara Piekutowski (132 Long Hall; piekb@clemson.edu, 656-3057)
Conference room scheduling; departmental visitor parking permits; notary public services;

Computer Specialist
Teela Roche (151 Long Hall, troche@clemson.edu, 643-6480)
Computer set-up and problems

Registration Coordinator
Jackie van Strien (138 Long Hall; vanj@clemson.edu, 656-0854)