Microbiology and Molecular Genetics (MMG)
Graduate Program Requirements and Guidelines

2018-2019
This handbook outlines program rules and requirements for MMG graduate program students. Students should also familiarize themselves with the rules and requirements of the Graduate Division of Biological and Biomedical Sciences and the Laney Graduate School via their handbooks.

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**MMG Leadership**

**Director:** Charles Moran

**Director of Graduate Studies:** Anice Lowen

**Recruiters:**
- Shonna McBride (Head Recruiter)
- Marcin Grabowicz (Co-Recruiter)
- Bernardo Mainou (Co-Recruiter)
- John Steel (Co-Recruiter)

**Executive Committee:**
(Alphabetically)
- Sarah Anderson- Student Representative
- Marcin Grabowicz- Co-Recruiter
- Chris LaRock- At-Large Member
- Anice Lowen- Director of Graduate Studies
- Bernardo Mainou- Co-Recruiter
- Shonna McBride- Head Recruiter
- Charles Moran- Director
- Cassandra Quave- Seminar Director
- John Steel- Co-Recruiter
- David Steinhauer- At-Large Member
- David Weiss- At-Large Member
- Jens Wrammert- Seminar Director

**Program Administrator:** Emily Morran

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**Goal of the Program**
The MMG program will provide training in the study of microorganisms as well as in the use of microbial models to investigate basic problems in molecular genetics. Students will take a common curriculum during the first two years. For more advanced training, students will choose among elective courses. The program will offer the Ph.D. degree in Microbiology and Molecular Genetics through the Graduate Division of Biological and Biomedical Sciences (GDBBS) of the James T. Laney Graduate School (LGS).

**Organization**
The MMG program is led by a Program Director. The Director is responsible for the overall administration of the program and will assure student performance to the University in the conferring of degrees achieved within the program. The Director will serve with the assistance of an Executive Committee. The Director shall chair the Executive Committee, which includes presenting and overseeing subsequent votes on any program decisions or changes under consideration by the committee. The Program Director may advise the DGS in student matters, if asked, and may advise the Head Recruiter in recruitment decisions, if asked. S/he shall oversee the appointments of any new faculty members as well as faculty compliance with program expectations and communicate those expectations if/when needed. S/he shall oversee the program budget. Finally, the Program Director is the program’s liaison to the GDBBS.
The Executive Committee:

- Evaluates the credentials of prospective faculty members and decides on offers of positions.
- Makes recommendations to the Director regarding the operation of the program and the development of policies within the program.
- Makes recommendations to the Director concerning the curriculum of the program, including the development of new courses for the program.
- Makes recommendations on student issues and needs that arise.

The Executive Committee will meet as often as necessary to handle programmatic issues.

Each position in the Executive Committee will be held for 3 years. Members’ positions will be up for election on a rotating basis such that multiple positions are up for election each year.

**Election Procedures for Faculty**

Open positions will be announced on the faculty listserv each spring/summer. Faculty will have one week to nominate themselves or others. At the close of one week, the Program Administrator will announce nominations and share a hidden electronic ballot. Voting will be open for one week. The Program Administrator will oversee the vote and report results to the Program Director. The Program Director will announce results following the close of the voting week.

**Election Procedures for Students**

The current Student Representative will solicit candidates from the post-candidacy students at least one month prior to the end of the term. If more than one student is interested, the current student rep will conduct a vote of the current student body using a hidden poll and announce the outcome to the students and Program Administrator following the vote.

The Program Administrator is the point of contact to assist all faculty and students within the program. For more information regarding the specific roles and responsibilities of each Executive Committee position, please contact the Program Administrator.

**Course Requirements**

The following (or their equivalents) are required of all PhD students in the MMG Program:

**Fall Semester Year 1**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>IBS 504</td>
<td>Intro Prokaryotic Genetics</td>
<td>6</td>
</tr>
<tr>
<td>*IBS 555</td>
<td>Basic Biomedical and Biological Sciences I</td>
<td>6</td>
</tr>
<tr>
<td>*or IBS 542</td>
<td>Concepts of Immunology</td>
<td>4</td>
</tr>
<tr>
<td>MMG 570R</td>
<td>Introductory Graduate Seminar</td>
<td>1</td>
</tr>
<tr>
<td>MMG 597R</td>
<td>Laboratory Rotations</td>
<td>1</td>
</tr>
<tr>
<td>MMG 792R</td>
<td>Colloquium in Microbiology</td>
<td>1</td>
</tr>
<tr>
<td>**JPE 600</td>
<td>Jones Program in Ethics</td>
<td>0</td>
</tr>
</tbody>
</table>
The summer prior to the start of Year 1, incoming students will consult with the DGS to determine which course, IBS 555 or IBS 542, is a better fit based on their background and research interests.

**The Jones Program in Ethics (JPE)** is a comprehensive program to educate doctoral students in all disciplines in the ethical pursuit of scholarly research. Training will take place both within interdisciplinary forums and also within the student’s graduate program. There are three elements to the program:

1. JPE 600, a one-day core course in scholarly integrity, supported by the Laney Graduate School in collaboration with the Emory Center for Ethics, will be required of all incoming graduate students.

2. Program-based training in ethics and the responsible conduct of research takes place within existing courses. Additionally, MMG and Immunology and Molecular Pathogenesis (IMP) students will attend faculty-led ethics seminars arranged by the MMG and IMP Directors. Six seminars will be presented in the fall of each year. For the 2018 academic year, the programmatic ethics seminars will take place on Mondays and Wednesdays at 4:00 PM in the Whitehead Auditorium. All first-year students are required to attend. This initial series is required for Candidacy eligibility. All fifth-year students are required to attend post-candidacy. Second and sixth year students must attend any lectures they missed in the previous year.

3. Students must attend a minimum of four JPE 610 topical public workshops, training sessions, or lectures offered by the graduate school before they graduate. These are not required to reach Candidacy, but students are encouraged to attend them early in their graduate school career. These are announced on the LGS listserv and will appear on the student’s transcript as a JPE 610 course.

For more information visit the JPE website.

**Spring Semester Year 1**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBS 513</td>
<td>Virology</td>
<td>5</td>
</tr>
<tr>
<td>MMG 570R</td>
<td>Introductory Graduate Seminar</td>
<td>1</td>
</tr>
<tr>
<td>MMG 792</td>
<td>Colloquium in Microbiology</td>
<td>1</td>
</tr>
<tr>
<td>MMG 597R</td>
<td>Laboratory Rotations</td>
<td>1</td>
</tr>
<tr>
<td>XXX</td>
<td>An Elective from the Spring list (see below)</td>
<td>credit hours vary</td>
</tr>
<tr>
<td>Or *IBS 538</td>
<td>Statistical Design and Analysis of Experiments</td>
<td>4</td>
</tr>
</tbody>
</table>

*All MMG students must complete IBS 538 in either Spring Year 1 or Spring Year 2.

**Fall Semester Year 2**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MMG 790R</td>
<td>Advanced Graduate Seminar</td>
<td>1</td>
</tr>
<tr>
<td>MMG 792R</td>
<td>Colloquium in Microbiology</td>
<td>1</td>
</tr>
<tr>
<td>IBS 522R</td>
<td>Hypothesis Design and Scientific Writing</td>
<td>4</td>
</tr>
<tr>
<td>XXX</td>
<td>An Elective from the Fall list (see below)</td>
<td>credit hours vary</td>
</tr>
<tr>
<td>*IBS 699R</td>
<td>Advanced Grad Research</td>
<td>credit hours vary</td>
</tr>
<tr>
<td>**TATTO 600</td>
<td>Teaching Graduate School Workshop</td>
<td>1</td>
</tr>
<tr>
<td>**TATTO 605</td>
<td>Teaching Assistantship</td>
<td>2</td>
</tr>
</tbody>
</table>
*Between course work and Advanced Grad Research a minimum of 9 credit hours are required per semester to remain a full-time student. Register for Advanced Grad Research last to determine how many credit hours will remain in order to fulfill the 9 credit hour requirement.

**Teaching Assistant Training and Teaching Opportunity (TATTO) is a Laney Graduate School teaching requirement that must be fulfilled before students are allowed to graduate. (see page 9 below for more info.) The requirement is usually fulfilled in the fall of your second year by completing TATTO 600 and TATTO 605.

TATTO 600 consists of a two-day workshop prior to the start of the second year. Information about this course will be distributed to students over the summer.

TATTO 605 consists of a one-semester TA-ship in either an undergraduate scientific course or an introductory level graduate course.

All students must contact Monica Taylor (monica.taylor@emory.edu) in the GDBBS office in May of Year 2 to be registered for both courses. Monica can provide further information at that time regarding options and assignment processes for TATTO 605. TATTO 600 and TATTO 605 do not count toward your 9 credit hours.

Spring Semester Year 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>MMG 790R</td>
<td>Advanced Graduate Seminar</td>
<td>1</td>
</tr>
<tr>
<td>MMG 792R</td>
<td>Colloquium in Microbiology</td>
<td>1</td>
</tr>
<tr>
<td>XXX</td>
<td>An Elective from the Spring list (see below)</td>
<td>credit hours</td>
</tr>
<tr>
<td>Or IBS 538</td>
<td>Statistical Design and Analysis of Experiments</td>
<td>4</td>
</tr>
<tr>
<td>IBS 699R</td>
<td>Advanced Grad Research</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBS 515</td>
<td>Current Topics in Molecular Genetics</td>
<td>2</td>
</tr>
<tr>
<td>IBS 542</td>
<td>Concepts of Immunology</td>
<td>4</td>
</tr>
<tr>
<td>IBS 560</td>
<td>Model Genetic Systems</td>
<td>4</td>
</tr>
<tr>
<td>IBS 568</td>
<td>Principles of Anti-Infectives</td>
<td>4</td>
</tr>
<tr>
<td>IBS 777R</td>
<td>Annual Reviews of Immunology</td>
<td>2</td>
</tr>
<tr>
<td>MMG 797R</td>
<td>Directed Study (see requirements below)</td>
<td>credits vary</td>
</tr>
</tbody>
</table>

Elective Courses Suggested for Fall

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBS 556</td>
<td>Basic Biomedical and Biological Sciences II</td>
<td>6</td>
</tr>
<tr>
<td>IBS 725</td>
<td>Prokaryotic Gene Expression</td>
<td>6</td>
</tr>
<tr>
<td>IBS 727</td>
<td>Genetics of Bacterial Pathogenicity</td>
<td>6 hours</td>
</tr>
<tr>
<td>IBS 742</td>
<td>Regulation of Cell Growth</td>
<td>6</td>
</tr>
<tr>
<td>MMG 797R</td>
<td>Directed Study (see requirements below)</td>
<td>credits vary</td>
</tr>
</tbody>
</table>

Directed Study

The purpose of Directed Study (MMG 797R) is to allow advanced students, already into their research projects, the opportunity of specialized training in areas not represented by the current courses offered by either our program or other programs. An outline of the
directed study must be submitted to the DGS or the curriculum committee for approval prior to registration.

**Additional Elective Options**
Many MMG students take advantage of courses offered in the LGS public health sciences graduate programs such as Epidemiology and Biostatistics. There are also opportunities to take elective courses at Georgia Tech. For more information, contact the DGS or the Program Administrator. Please note that any courses taken outside of GDBBS **must** be approved by the course instructor and the program DGS before a student can enroll. Students must also discuss elective courses with their mentor to ensure the course will benefit their research and training trajectory.

**MD/PhD Requirements**

**Spring of M2 Year**
- **IBS 513** Virology 5 credit hours
- **MMG 792R** Colloquium in Microbiology 1 credit hour
- Laboratory Rotations through the MD-PhD Program

MD-PhD students should email a copy of their Dissertation Advisor Assignment Agreement form to the MMG Program Administrator as soon as they affiliate with a lab but no later than September 1 of their G1 Year.

**Fall of G1 Year**
- **IBS 504** Intro Prokaryotic Genetics 6 credit hours
- **IBS 522R** Hypothesis Design and Scientific Writing 4 credit hours
- **MMG 790R** Advanced Graduate Seminar 1 credit hour
- **MMG 792R** Colloquium in Microbiology 1 credit hour
- *IBS 699R** Advanced Grad Research credit hours vary
- **JPE 600** Jones Program in Ethics 0 credit
- ***TATTO 600** Teaching Graduate School Workshop 1 credit hour
- ***TATTO 605** Teaching Assistantship 2 credit hours

*Between course work and Advanced Grad Research a minimum of 9 credit hours are required per semester to remain a full-time student. Register for Advanced Grad Research last to determine how many credit hours will remain in order to fulfill the 9 credit hour requirement.*

**See information about the Jones Program in Ethics on page 5.**

**See information about TATTO on page 6.**

**Seminars, Journals, and Research Clubs**
All students will attend the weekly MMG seminar series (MMG 570 or MMG 790R). In addition, there are weekly programs of invited speakers for the Department of Microbiology and Immunology, the Graduate Program in Immunology and Molecular Pathogenesis, the Program in Genetics and Molecular Biology, the Infectious Disease Division and Grand Rounds at the CDC, all of which often include topics of interest to MMG students. Often, seminar topics at Emory are chosen to correlate with the advanced courses being offered. For example, in IBS 504, there is generally at least one visiting speaker lecture in the course as well as presenting public seminars. Additionally, there are less formal research/journal clubs. Students attend seminar every Monday and are
required to give a Research in Progress seminar to the Program at least twice before graduating.

For student Research in Progress Seminars, two students will give a 30-minute presentation of their research during the regularly scheduled seminar time. Each student must do at least 2 oral presentations before graduating. If a student gives an oral presentation at the yearly GDBBS Symposium, this talk will count towards the 2 oral presentation requirement.

The Seminar Directors and Program Administrator will advise each student when they are due to present.

**Laboratory Rotations**

At the start of the first semester, students attend an Introduction to Faculty Research series in which Program faculty briefly describe their research and lab. These presentations allow students to begin thinking about where they would like to rotate and who they may want on their dissertation committee.

Students are required to perform at least three rotations during the first year and the rotations should follow the dates indicated on the *Laboratory Rotation Agreement Form*. (All forms are available on the [MMG website](http://mmgwebsite.com).) Some students may decide to start in the summer before the first semester or do an additional rotation during the summer after their second semester.

There are two major reasons for the rotations: familiarization with a diversity of techniques and scientific approaches and the selection of the lab in which to perform your dissertation research. A *Laboratory Rotation Agreement Form* must be completed for each rotation. Additionally, the student submits a brief written report of the research they performed, by the end of the rotation, to their rotation mentor, the DGS, and the Program Administrator. The DGS will also collect statements from faculty rotation mentors. These statements will indicate how the student met or did not meet the expectations. The statements will also include a suggested grade. If the grade is less than an “A”, the mentor will need to document where the student was deficient and what steps were made prior to the end of the rotation to address the needed changes. If the suggested grade is less than an “A”, the DGS will meet with the student to discuss the situation prior to issuing the final grade. The combination of the student’s written report and the mentor’s statement will provide the foundation for the rotation grade. Rotations span the full academic year. As such, at the end of the fall semester, all first-year students will receive an “in-progress” grade of “IP”. Then, at the end of the spring semester, the DGS will average the three rotation grades together to issue a grade for both semesters’ rotation work.

**Mentors/Advisors**

During the first-year lab rotation period the Director of Graduate Studies (DGS) serves as the official advisor for all students until the student chooses a dissertation mentor. The DGS meets with the students at the beginning of the fall semester to discuss coursework, rotations, and other first year issues and obligations, and will be available, along with the MMG Student Rep, to help guide students and assist with any problems that might arise.
Most students select a dissertation mentor within two weeks of completing the third rotation. This faculty member then becomes the major advisor for the student. However, the DGS remains a resource for all MMG students throughout their time in the Program.

The *GDBBS Mentor Agreement and Finance Information Form* must be completed and submitted to the Program Administrator to formalize your mentor agreement. This form is due by Friday, April 12, 2019. If a student is not ready to affiliate with a lab and needs to complete an additional summer rotation, the student should confer with the DGS prior to organizing any summer rotations and dates. Then, they should submit a *Laboratory Rotation Agreement Form* by Friday, April 12, 2019 and promptly begin a summer rotation. Dates for the summer rotation should be worked out in consultation with the DGS.

Note: Students who choose a mentor at the CDC must have a co-advisor who has an Emory University faculty appointment.

**Choosing a Mentor**
The most important decision a student will make in graduate school is the selection of a research mentor. This relationship will be the foundation of the student’s training and future career endeavors and should not be entered into lightly. The Program encourages students and faculty to consider the following before making these agreements:

1) Is this a positive and enjoyable interpersonal match?

2) Do we have a clear understanding of how we will communicate? (frequency of one-on-one meetings and lab meetings, expectations at meetings, shared understanding of how lab notebooks are kept, preferred method of communication outside of regularly scheduled meetings- ie: phone, text, email, pop-in vs. schedule, etc.)

3) Do we share an enthusiasm for the area of research and proposed project?

4) For students: Does this faculty member have a positive record of student training?

5) For faculty: Does this student’s mode of and response to learning match my training style?

6) For students: Do I feel supported by this faculty member?

7) For faculty: Has this student shown respect for my lab and decisions?

8) Do I feel confident we can resolve conflicts that will arise?

The *LGS Mentoring Guide* for students is also a valuable resource in thinking about the type of mentoring relationship you would like.

The laboratory rotations provide the obvious opportunity to consider many of these questions. Additionally, students are encouraged to:

- Read all recent papers from the lab they are considering
- Talk with current students
- Talk with the DGS
- Schedule meetings with potential mentors to discuss questions important to each of you before establishing the relationship.

**Forming Your Dissertation Committee**
The Dissertation Committee consists of five faculty members, including the advisor; at least three of the faculty members must be members of MMG. The constitution of this committee must be approved by the DGS. To formalize the committee selection, students
must submit the *LGS Dissertation Committee Form* following the on-line submission instructions no later than March 15 of Year 2 in conjunction with the Abstract Submission Date (see “Qualifying Examination” info below for more on the Abstract.)

In addition to overseeing the student’s general progress on their dissertation work, this committee will oversee the student’s qualifying examination, as well.

**Qualifying Examination**

By the end of May in the second year (G1 Year for MD-PhDs), students are expected to have submitted a research proposal to their committee and passed an oral examination based on this research proposal. The proposal should be related to their dissertation work and may be the same proposal that the student prepared in IBS 522R Hypothesis Design and Scientific Writing. The research proposal should follow the NIH proposal guidelines (See MMG Dissertation Research Proposal section below for more details). The primary purpose of this examination is to give the students the opportunity to develop an original and significant written scientific proposal and to defend it before a group of scientists who have relevant expertise. The examination is used as a teaching device and is one of the methods used to follow a student’s academic progress. Recommendations for improving a student’s progress are expected to result from each examination. In preparation for this milestone:

1) As noted above, students must formalize their dissertation committee by submitting the *LGS Dissertation Committee Form* by March 15. This committee will also be their examining committee.

2) Also by March 15 of the second year (G1 Year for MD-PhDs), students must submit to their committee a 200-300 word written abstract that concisely states the problem, an original testable hypothesis, and an outline of experiments to test the hypothesis. A specific goal of this exercise is to train students to think concisely and to write meaningful short abstracts.

3) The Examining Committee will consist of the student’s Dissertation Committee and the DGS. (Students in the lab of the DGS will have an alternate DGS, typically a past DGS or the Director, on their examining committee.) Students are responsible for organizing the examination date with the Examining Committee (generally late April or early May). The full research proposal (*see section below regarding the Research Proposal*) should be submitted to the Examining Committee at least 2 weeks prior to the oral examination date. Students should contact the Program Administrator for assistance in obtaining a room for the exam, if needed. At the exam, students should supply each committee member with a copy of the first page of the Qualifying Exam Form.

4) The day of the exam, the Examining Committee will question the student on the proposal during the oral examination with three rounds of discussion. The first round of questions is aimed at the technical details of the student’s proposed research. The second round pursues more fundamental and quantitative areas concerned with the proposition and is oriented toward challenging the student’s intellect. The third round concerns more peripheral areas that test the student’s knowledge of big-picture concepts within their field of research. Third round questions may also draw on the content of required MMG courses such as IBS 513 and IBS 504. The student is expected to use the
blackboard effectively to present a hypothetical working model and address questions; PowerPoint presentations are not permitted.

5) Immediately after the oral exam, the committee evaluates the student’s performance, determines whether a need exists to retake an additional exam and makes written recommendations pertaining to future training on their copy of the first page of the Qualifying Exam Form. Students are also encouraged to speak with the faculty examiners after receiving their written comments.

6) The final step in the qualifying exam process is for the student to write a summary of specific action items and committee feedback in conjunction with their advisor. This summary statement of the feedback is then approved by signatures from each committee member on the second page of the Qualifying Exam Form. Students must submit all pages of the Qualifying Exam Form to the Program Administrator within one week of the exam to document this Program milestone.

7) Students may receive a “Pass”, “Conditional Pass” or “Fail” from their examining committee. This determination is based off of a comprehensive assessment of their abstract, written proposal, and oral defense.
   a. If a student receives a “Conditional Pass” the committee will require the student to complete additional work documenting that they have acquired the knowledge necessary for a portion of their exam deemed insufficient. The committee will list a due date, and the student should ensure they submit the requested materials to the Examining Committee for review and to the Program Administrator for their file. In most cases, with a “Conditional Pass,” a student will not need to meet with the Examining Committee again as long as they submit what is requested by the due date.
   b. If a student receives a “Fail” on their exam, they will have until the end of the second week of August to prepare the project, technical, and/or background knowledge the examining committee has identified as insufficient and complete a Qualifying Exam re-take. The committee should clearly note the areas of concern on the Qualifying Exam Form and the student should use this to guide their preparations for a re-take exam. The student should arrange a re-take exam date with their examining committee, and submit any written edits needed for their proposal to the committee two weeks prior to the re-take exam date. At the re-take, the student will work through three rounds of questioning just as before. The re-take exam should be documented on a new Qualifying Exam Form in the same manner it was for the original exam. The student should submit both sets of Qualifying Exam Forms to the Program Administrator within one week of their re-take exam.

A student may receive a "conditional pass" on a re-take, but the committee will need to list a specific remedy for a specific area of deficiency and give a very clear due date for completion of the remedy. The DGS will need to review and approve any "conditional pass" plans given by the committee before they become part of the student’s permanent file. If a student does not complete the remedy in the time allowed by the committee, the "conditional pass" will revert to a “fail”. If the student does complete the remedy in the allotted time, the student may proceed in the Program and will be considered to have passed their re-take. Examples of remedies could be re-taking a particular course or reading, discussing with their mentor, and writing a review of a particular set of papers, etc.

If a student fails a re-take exam, it will result in dismissal from the MMG Program.
**MMG Dissertation Research Proposal**

The proposal should follow standard NIH guidelines for an F31 Proposal and contain a title page (title of your proposal and your name), abstract/summary (no more than 30 lines of text), Specific Aims page, Research Strategy section, and Bibliography/Literature Cited section. Students may use the proposal they prepared in IBS 522r or they may choose to prepare a new proposal. Either way, the proposal should reflect the work the student and mentor have agreed on as the framework for their dissertation.

The body of the proposal will consist of the Specific Aims page and the Research Strategy.

Specific Aims - ideally two or three major goals of the research project. This should be a brief introduction and hypothesis of the project and two or three explicit aims of the proposal - do not exceed one page!

Research Strategy – consists of three sections, not to exceed six pages total.

1) **Significance** (1-2 pages suggested) – Why is the research important and why should it be funded.

2) **Preliminary Results** (about 1 page suggested) – This section outlines experimental data that provide the basis for the proposed experiments. Ideally, the students should have some results of their own to present here; however, it is not unusual for students to have little or no solid data at this stage. Therefore, this section can include results from others in the PI's lab, or results from other labs that may be directly relevant to the proposed experiments.

3) **Approach** – (about 4 pages suggested) This section describes experimental design and methods - This section should restate each Specific Aim individually and address rationale and design for the proposed experiments, techniques to be utilized, anticipated or possible results, and pitfalls and alternatives for the proposed studies. The examining committee is likely to focus their oral discussion primarily on this section.

Despite the page limits, the use of models, figures, graphs, tables, or flowcharts is encouraged when appropriate to supplement, summarize, or clarify specific topics that are addressed in the text.

There are no page limits to the Literature Cited section.

**Admission to Candidacy**

All students are required to follow the Laney Graduate School requirements for candidacy. Most MMG students will reach candidacy by the end of their second year once they have passed their Qualifying Exam.

To be eligible for candidacy, the student must meet the following requirements:

1. Complete all program requirements for candidacy: coursework and other training required by the degree program, including program required JPE training
2. Complete qualifying examinations required by the degree program

3. Select Dissertation Committee and submit LGS Dissertation Committee Form

4. Complete TATTO 600, TATTO 605, and JPE 600

5. Resolve any Incomplete (I) or In Progress (IP) grades

6. Be in good standing with a minimum cumulative 3.0 GPA

7. Have earned at least 54 credit hours at the 500 level or above

Further details, including penalties for not meeting the LGS deadline, can be found here.

This policy is effective starting Fall 2017 (including students who participated in Early Start in Summer 2017). For students who entered their program prior to Fall 2017 they must reach candidacy no later than August 1 before their fifth year of study.

**Dissertation Committee Meetings**

The MMG program recommends that the first committee meeting be held within one year of passing the qualifying examination but no later than the end of the summer term following the student’s third year. This is the latest deadline allowed by the Division. Beginning in Year 4, students should meet with their committee every 6 months.

At least one week prior to the committee meeting the student must send all committee members the location of the committee meeting and a one-page progress report highlighting what will be discussed at the meeting.

The objectives of the meeting are:

1. Discuss career development
2. Evaluate the progress of the student
3. Review short-term goals accomplished
4. Evaluate next short-term goals
5. Determine whether student is on track to graduate in a timely manner

At the meeting, the student must incorporate the MMG Dissertation Committee Meeting Slides. These slides can be inserted wherever the student feels is most appropriate and are designed to ensure discussion about the student’s career goals and objectives.

On the MMG Dissertation Committee Meeting Form, after each meeting, the student will summarize the comments and feedback given by the committee and develop an action plan in conjunction with their mentor. Within one week of the meeting, all committee members must sign off on this summary and action plan on the MMG Dissertation Committee Meeting Form. To facilitate a timely completion of this process, students should schedule 5-10 minute one-on-one meetings with each committee member for the week following the committee meeting.

Within 1 week of the meeting, students must submit their 1-page progress report, presentation slides, and MMG Dissertation Committee Meeting Form to the Program Administrator to be maintained in their file. This packet is the documentation of the
student’s meeting as well as confirmation of the student’s adequate progress in the Program.

Navigating Graduate School

MMG provides an environment for scientific training and the development of professional skills, including clear communication, collaboration, and conflict management. When professionals are working closely together on projects, disagreements will arise from time to time. When such disagreements occur, MMG hopes to create a framework for students and their mentors to find a path to work together towards an outcome that is mutually beneficial. MMG recommends faculty and students follow these steps to resolve conflict:

**Step 1:** Always begin by attempting to resolve the issue amongst yourselves

*Think about the environment, timing, and communication style to set up the conversation for the best possible outcome.

*Use communication that is clear and calm. See the two articles below for some great insight and practical tips on effective communication.*

http://www.sciencemag.org/careers/2008/06/mastering-your-phd-better-communication-your-supervisor

https://sharepoint.washington.edu/phys/grad/Forms/phd_MentorCommunicationCWD.pdf

**Steps 2-4 can happen in any order or concurrently as needed for your situation.**

**Step 2:** Talk to your MMG support team

DGS: The MMG DGS will give you the program perspective on the matter- what the program expects of a faculty member and a graduate student in your specific situation. The DGS can be a sounding board or an advocate depending on your situation. Sometimes it is helpful to bring the DGS into the meeting to mediate the interactions between the mentor and the student.

Program Director: If the DGS is unavailable, you can also see the Program Director for virtually the same support as you would have from the DGS.

Program Administrator (applicable to students): The PA is a point of contact to all other resources in your program, the Division, and the University. The PA can act as a sounding board or a safe space to confidentially vent about your situation. The PA can also help you determine if your situation should be conveyed to other supervising entities (ie: DGS, GDBBS staff, etc.).

Student Representative (applicable to students): Your student representative can provide peer support and context for your situation. They can help you think through how to communicate with the faculty member, share their own experiences and advice and offer a supportive, listening ear.
Step 3: Utilize the student’s committee

If a conflict arises between a student and mentor, the committee can serve as advocates for both the student and the mentor—depending on the situation. When used well, they can be an effective team for navigating disagreements and developing beneficial solutions. They are often the group most well versed with the science AND the personalities of the mentor and student. Both students and mentors should be able to contact members of the committee for feedback on the situation. Ask them how they would resolve it. If necessary, schedule a committee meeting. Ultimately, the committee has the responsibility of advising the student towards dissertation and defense and can intervene when either the student or mentor is making choices detrimental to this final goal.

Step 4: Utilize GDBBS staff

Contact the Director of Student Development, Monica Taylor. She has a wealth of experience on behalf of faculty and students. She is a fantastic listener and well versed in the resources on campus as well as the Graduate School policies and Division policies that may pertain to your situation.

Finally, here are a few additional resources for faculty and students that can help maximize the mentoring relationship:

http://www.icre.pitt.edu/mentoring/challenges_solutions.html

http://www.ohsu.edu/xd/education/schools/school-of-medicine/faculty/mentoring/mentoring-best-practices/index.cfm

http://www.emory.edu/CAMPUS_LIFE/initiatives/programs_and_resources/ombudsperson.html

Building Successful Mentoring Relationships: LGS Student Guide

Building Successful Mentoring Relationships: LGS Faculty Guide

Atlanta Society of Mentors- Mentoring Resources

Dissertation and Final Defense

Students should refer to the LGS handbook and website for important information regarding dissertation completion time, forms, and due dates each semester.

Each student will be expected to submit a written dissertation in compliance with the rules and deadlines of the Laney Graduate School. To receive the Ph.D. degree, the student is expected to have completed an original contribution to research, as demonstrated by publications in leading peer-reviewed journals. Generally, a minimum of one first author paper should be published by the student in a top quality journal indexed in PubMed (society journal or higher), though most students will be expected by their mentor and committee to exceed these standards.
Approximately six months prior to the anticipated defense, the student will meet with the committee to outline progress, publications and anticipated publications, and plans for completing the dissertation research. At this time the committee either approves of the plan or outlines further recommendations or requirements for the student. When the plan is approved, the student will move towards completion of manuscripts to be submitted and the formal written dissertation.

At this point, in preparation for the defense and graduation, it is recommended that the student refer to the “Planning for Graduation” checklist located at the bottom of the MMG Student Timeline.

The dissertation should be made available in final form to the committee at least 2 weeks prior to the public, oral defense.

The dissertation and its presentation should demonstrate that the student has learned to plan, design and interpret experiments independently.

In anticipation of the public defense, the student must submit a Defense Flyer and Program to the Program Administrator to be distributed on the seminar listserv and posted on the program website calendar. These public announcements must go out at least 2 weeks prior to the public defense. Templates for these items are available on the program website.

Following the oral defense, the dissertation committee examines the student further regarding the research and decides on the final acceptance of the dissertation. Approval of the dissertation by the Dissertation Committee should be unanimous. In the event of serious disagreement, the Executive Committee of the Program will review the opinions of the committee members and make a final determination.

The dissertation form should contain:
  A) An inclusive (5-10 page) introduction to provide an overall focus for the manuscript(s)

  B) The published or to-be-published manuscript(s) (for multi-author manuscripts, the actual contribution of the student to the paper should be summarized)

  C) Other unpublished results which can be included as a separate chapter

  D) A summary and conclusion section (5-10 pages) in which the contribution of the research to the field is discussed and which also includes a discussion of future directions for research

  E) References

Other papers by the student on other topics may be included as an appendix.

Your dissertation must meet all Laney Graduate School requirements.
Master's Thesis
In certain instances it may be necessary for graduate students to complete their course of study with a terminal Master’s degree. The mentor and student together will request to have the student switched to a terminal Master’s track by contacting the Director and DGS. If the program approves, the Director or DGS will inform the GDBBS office by contacting the Program Administrator and Monica Taylor. To be eligible to receive a Master's degree, the student must perform a research project and complete an acceptable Master's Thesis. The organization of the thesis is similar to that of the traditional Ph.D. dissertation, which would include, in order, the following sections: Introduction, Materials and Methods, Results, Discussion and Literature Cited. The student will defend the thesis at a closed meeting with his or her committee. The committee will determine if the body of work completed and presented is sufficient to constitute a Master’s thesis and warrant a Master’s degree. After graduating with a Master’s degree, the student may return to the program but will need to re-apply for admission.

Review of Student Progress
Students placed on academic probation per the Division standards listed in the Division Handbook will receive a notice of probation from the Laney Graduate School. The Director, DGS, Program Administrator, student, and student’s mentor will meet to discuss the student’s progress and develop a plan to address the student’s learning needs. If a letter of appeal is requested by the Laney Graduate School, the student will draft this with assistance from their mentor and Program leaders and ensure they meet the deadline.

Throughout the year, the DGS and Director will meet to review the progress of all students in the program. For first year students, this is based on grades and rotation project work. For second year students, this is based on grades and successfully passing the Qualifying Examination. For students in years 3 and up, this is based on the research grades issued by the mentor and the Dissertation Committee reports from meetings as well as completion of meetings within the time frame required of the Division as listed in the Division Handbook. If any students are in jeopardy of not progressing towards their degree due to failures on the Qualifying Exam, low grades in courses, or missed committee meetings, the Executive Committee will meet to discuss the student’s situation, vote on whether the student should remain in the Program, and outline the steps needed to regain satisfactory standing. Prior to the meeting, the Director will notify the student and mentor of the concern, and ask if they have any information they would like the Executive Committee to take under advisement. Following the meeting, the Director will meet with the student and mentor to share the outcome of the committee’s discussion and clearly line out what steps need to be taken and the time frame for completion.

Transferring Programs
Students currently enrolled in other Programs within the Graduate Division of Biological and Biomedical Sciences should send a letter to the Director explaining their reasons for requesting a transfer to the MMG Program. Each request will be considered by the Executive Committee, which may require that a transferring student take one or both parts of the Qualifying Examination, as well as specific courses. If approved by the Program, the request will then need to be reviewed and approved by the Director of the GDBBS and the Dean of the LGS.
**Attendance at Scientific Meetings**
When they have reached an appropriate stage in their research, trainees are encouraged to present their results at both local and national meetings. Attendance at such meetings should help in meeting others engaged in their field of research and to explore future job opportunities. It will also provide them with important experience in communication and presentations skills as they listen to a variety of presentations by others of current research.

If students would like to receive Professional Development Support Funds for attending and presenting at a conference they should refer to the Laney Graduate School PDS Funds Handbook. Students may direct questions about PDS Funds to Margie Varnado in the GDBBS office.

**Graduate Student Vacation Policy**
Graduate study is a full-time endeavor. Students receive a stipend and are expected to be actively attending classes or conducting research and working toward the degree year-round, including the period between terms. The time between terms (including Fall and Spring Break) is considered an active part of the training period and is not considered a vacation or holiday. Students will continue to receive stipends during vacations and official University holidays. Students on training grants and fellowships may receive leave for the same vacations and holidays available to individuals in comparable training positions at Emory. Unauthorized absences may result in an unsatisfactory research grade for the term (i.e., in fall, spring, or summer), and could thereby lead to probation. Students who are funded by research projects are allowed up to two weeks of vacation each year, in addition to official University holidays. Students who wish to take vacation must let their advisor know of their plans at least two weeks before the planned absence. Students who wish to take additional periods of times off must get approval from their Program’s Director of Graduate Studies and their Dissertation Advisor.

**Graduate Student Parental Accommodation Policy**
LGS Parental Accommodation Policy is for students with substantial parenting responsibility as a result of childbirth, care of newborn, or a newly adopted child. This policy guarantees PhD students a minimal level of accommodation during the transition of parenthood. For more information on the policy, eligibility requirements, and application procedure, go to this link.

**Employment Restrictions Policy**
Doctoral education demands full-time effort. Students receive stipends and tuition fellowships in order to allow them to commit the necessary time to their studies and research. Unrelated employment serves as a distraction and interferes with the ability of students to meet degree requirements in a timely manner. For these reasons, employment not directly related to students' degree requirements and professional development goals is strongly discouraged.

If additional income is absolutely necessary while a student is enrolled in the degree program, s/he must receive prior approval from her or his mentor and the Director of Graduate Studies. The Director of Graduate Studies has the prerogative to bring the request to the program’s Executive Committee for discussion.
Requests to work more than 10 hours a week require the completion of the above process as well as written approval from the Dean of the Laney Graduate School. Students who wish to request permission to seek employment should allow 30 days for review. In the rare cases in which approval is granted, students must ensure that employment does not interfere with research performance, progress toward degree, or any program requirements, including seminar attendance.

Additional Policies of Interest
Please note these additional Emory policies that have been highlighted by the LGS.

Student Support Services
Graduate school can be a stressful time on your body and mind. Be sure you are taking care of yourself. Go to Laney Graduate School student support page and the GDBBS student support page for links to all student support services available to you.

Accessibility Services
As noted on the Office of Accessibility Services website, “Emory provides all persons an equal opportunity to participate in and benefit from programs and services afforded to others. The Office of Accessibility Services (OAS), part of the Office of Equity and Inclusion, assists qualified students, faculty and staff with obtaining a variety of services and ensures that all matters of equal access, reasonable accommodation, and compliance are properly addressed.” OAS “is committed to providing access to campus resources and opportunities to allow students with disabilities to obtain a quality educational experience.”

Qualified students need to register with OAS and make a request for services. Confidentiality is honored and maintained.

Faculty-Specific Program Policies
Faculty mentors are expected to assist their students in meeting the requirements outlined above. Additionally, as a member of this training program, MMG faculty should:

1.) Attend at least 3 MMG student presentations/year. These can be dissertation defenses, student research in progress seminars, or an MMG presentation at the DSAC Symposium.
2.) Teach an average of 1 hour/year over a 3-year period in classes attended by MMG students.
3.) Be available to serve on at least 2 MMG student dissertation committees.
4.) Be available to serve at least 5 hours/year for the MMG Program. Service includes holding a Program Leadership position, Program committee work, administering qualifying exams, or attending Program events.
5.) Be available to participate in the MMG Recruitment events if not out of town.
6.) Respond to the annual MMG faculty review survey as well as NIH-required trainee information requests within deadlines given.
7.) Maintain a positive and safe training environment that follows the Ethics and Conduct expectations set forth in the Emory Faculty Handbook- Chapter 12.
8.) Adhere to the University expectations for graduate mentors as outlined in Emory Policy 7.9.

Faculty also must submit an MMG-specific Mentor Agreement for each new student they take in their lab. The Director will email this agreement form along with additional
mentoring information to each proposed mentor once the Program Administrator has received the GDBBS Mentor Agreement and Financial Information Form in the Program office. The purpose of this form is to draw attention to Emory’s policies as they pertain to the training of graduate students and clearly state the Program’s expectations of faculty commitments and behavior towards students at the start of the professional mentoring relationship. After being contacted by the Director, the proposed mentor should review this agreement form, complete it, and email it to the Program Administrator for the student’s file.