



EMORY

LANEY
GRADUATE
SCHOOL

Genetics and Molecular Biology
Graduate Program

Graduate Division of Biological and Biomedical Sciences

GMB Guidelines

2017-18

GUIDELINES FOR PROGRAM IN GENETICS AND MOLECULAR BIOLOGY

GRADUATE DIVISION OF BIOLOGICAL AND BIOMEDICAL SCIENCES

Last Amended: August 2017

ORGANIZATION

The PROGRAM IN GENETICS AND MOLECULAR BIOLOGY (GMB) shall consist of a Program Director, a Director of Graduate Studies, an Executive Committee, the GMB faculty, and the GMB students.

The GMB shall be headed by a Program Director, elected by faculty vote and approved by the Director of the Graduate Division of Biological and Biomedical Sciences (GDBBS). The Director shall serve a three year term and be responsible for the overall administration of the program and shall 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 Executive Committee shall consist of a minimum of seven members from the GMB faculty, one member being the Director, and other members to include the Director of Graduate Studies, the Director of the Training Grant, the Chair of the Curriculum Committee, the Chair of the Oral Exam Committee, the Chair of the Written Exam Committee, and the Chair of the Admissions Committee (described below). Additional members may include Faculty Representatives, which will be non-tenured faculty with a minimum of 2 consecutive years of active membership in the GMB program. Executive Committee members are elected by vote of the GMB faculty and communicated to the Director of the GDBBS. All elected positions are to be subject to nominations and elections every three years, with elections for three of the six positions staggered by one year. The Executive Committee shall serve to advise the Program Director in all matters. The Executive Committee shall, as a body and through its appointed committees, make recommendations to the Director on: a) admission of students to the program, b) the development of policy within the program, c) development of the curriculum of the program, including the development of new courses for the program, and d) the progress of students in the program.

In addition to the above faculty positions, and to provide feedback regarding GMB policy and activities from the students to the faculty and leadership of the program, a senior (3rd or 4th year) and a junior (2nd year) student should be elected each year to serve on the GMB Executive Committee. To maintain confidentiality, the student representative will be excluded from any conversations involving disciplinary actions or other personal issues of faculty or students.

One member of the Executive Committee shall serve as the Director of Graduate Studies (DGS). The DGS should serve for at least three years. The DGS will: a) supervise and monitor the progress of enrolled students; b) coordinate new student laboratory rotations; c) aid new students in choice of laboratory; and d) coordinate the qualifying exams.

The Director and DGS will be available to discuss all issues with students and faculty in the program.

The Standing Committees and their responsibilities are as follows:

Admissions Committee: Responsible for enhancing and developing recruitment activities, reviewing applications and selecting applicants suitable for interviews, and organizing the interview process and admissions selection process.

Curriculum Committee: Responsible for setting coursework requirements, reviewing existing courses, and formulating proposals to modify courses and coursework requirements.

Oral Qualifying Exam Committee: Responsible for ensuring the integrity, consistency, and goals of the Oral exam component of the Qualifying Exams. Responsible for organizing and providing program members that comprise the faculty members of each student's Examination Committee.

Written Qualifying Exam Committee: Responsible for ensuring the integrity, consistency, and goals of the Written exam component of the Qualifying Exams. The committee is composed of members of the Executive Committee and additional faculty members. Responsible for soliciting written exam questions from faculty, selecting, editing, and formatting questions for the exam, and assisting the DGS in organizing the grading of the exam.

Faculty Review Committee: Responsible for the annual review of all faculty members. The committee chair will request a report from each member of the GMB faculty and this committee will be responsible for the review to ensure faculty are active and engaged in the program.

FACULTY APPOINTMENTS

Members of the GMB faculty shall be appointed by the Program Director with the advice of the Faculty Review Committee and GMB faculty vote. The Director will appoint the Faculty Review Committee. Final approval for membership is by the Director of the GDBBS.

Faculty wishing to join the GMB Program, will initially be required to submit an application to the Director and PA. Upon review and approval, the applying faculty will be asked to schedule and deliver a research seminar to the GMB program at large.

Application. All applying faculty should consult with the GMB Program Director to discuss appropriateness and faculty responsibilities of membership in the GMB program. Faculty should submit the following application materials, items 1-10, to the Director and PA:

1. Level of Appointment Desired (Full Member, Associate Member, Adjunct Member)
 - a. **Full Members** must be tenure track faculty at Emory University in good standing. They have full rights and privileges, including the right to serve on any GDBBS Committee or in an administrative position, and to act as Dissertation Advisors in Programs where they hold this rank.
 - b. **Associate Members** must be faculty at Emory University. These faculty members have the rights and privileges of full members, except they may only serve as a Dissertation Co-Advisor. Generally, this membership would be for Research Track faculty, for faculty who may not take a student because of indebtedness to the Stipend Reserve Fund or those who have been judged to be non-participatory during the annual Program Review of participation.
 - c. **Adjunct Members** must be faculty or staff of another institution and must have credentials similar to those of our Full Members. They will have all the rights and privileges of full members, except that they may only serve on the University or GDBBS committees ex officio and they may only serve as Dissertation Co-Advisors.
2. Emory Net ID
3. Emory Employee ID
4. NIH Biosketch (new format: <http://grants.nih.gov/grants/funding/424/index.htm#biosketch>)
5. Curriculum Vitae
6. Indication of current grant support (may be included in Biosketch or CV)
7. Short research description (limit of 150 characters)
8. Long research description (limit of one page)
9. Letter from candidate indicating their desire to become a training faculty member within the Division and willingness to meet the teaching commitments of the Program
10. Letter from candidate's department chairperson indicating their support of the appointment – include a description of the candidate's independence and the Departmental commitment of space
11. Letter from Program Director indicating the support and approval of the appointment on behalf of the Program Executive Committee. (*Director will submit this letter once a seminar is presented and the GMB faculty at large votes to approve the application.*)

Notes: Faculty applicants should have a tenured or tenure track appointment. Faculty applicants who are already members of another GDBBS program will need to contact the PA first to determine what materials are necessary to join GMB as a second or third program. A seminar should also be scheduled and given prior to the GMB faculty vote.

An opportunity will be provided for current faculty to meet individually with faculty applicants. The Faculty Review Committee will solicit faculty opinions. Once approved for membership in the GMB program, the application will be forwarded to the GDBBS for the Division Director's approval, and then to the LGS for the Dean's final approval. The instructions regarding this process can be found at <https://secure.web.emory.edu/biomed/intranet/faculty/joining-a-program.html>.

REVIEW OF FACULTY

This should occur every year.

Faculty members will be notified by the Faculty Review Committee chair to submit a completed Annual Report that details their contributions to the GMB program in the preceding academic year. Failure to submit an Annual Report will be considered evidence of non-compliance.

As indicated in the Guidelines of the GDBBS, assurance from faculty members or their Departmental Chairs that funds are available to them for student support (including stipends) should be provided.

All faculty are expected to make a major contribution to teaching an advanced graduate course in the Program. Faculty who have major responsibilities for introductory courses should teach advanced courses at least once every five years; those with little or no introductory course responsibility should teach at least every three years. To ensure that courses proposed by the faculty are those desired by students, all new courses should be discussed with, and reviewed by the Curriculum Committee. Faculty should be aware that it takes six months to a year to get a new course approved and should therefore initiate the process early.

Compliance in teaching can include:

- Faculty teaching 13 or more contact hours in a single course once every three years.
- Faculty teaching 24 or more contact hours over the last three years combined. All graduate courses may be combined.
- Faculty holding the rank of chair, director, or teaching 13 or more contact hours in a single course once every five years or 24 contact hours in the last 5 years, combined as above.
- Individual Directed Study courses will not count towards this requirement.
- Faculty can earn 2 hours teaching credits if they teach 13 or more contact hours in non-graduate school courses. Such courses could include undergraduate courses, medical school/PA courses and etc.

Faculty must provide this teaching information in their annual reports in a clear and organized fashion.

All GMB course instructors will solicit and submit course evaluations each semester to the Curriculum Committee.

All faculty are expected to participate actively in the recruitment of graduate students for the Program in ways to be determined by the Executive Committee.

All faculty are expected to give a seminar on their research at least once every three years at a venue on campus that is open to attendance by GMB faculty and students.

Faculty are also expected to participate in GMB seminars, attend GMB functions, and the GMB retreat.

In the absence of mitigating circumstances, faculty members who are not in compliance with the policy will be considered to be on probation and cannot take new students into their laboratories for either thesis research or laboratory rotations until such time as they are again in compliance with the policy. Existing students will not be affected, and faculty will be able to participate in other Program activities.

In its implementation of the faculty review, the Faculty Review Committee defines non-compliance as either a lack of peer-reviewed grant support for three years or not making a major contribution to teaching as defined above. A faculty member will be considered to be again in compliance with the policy either upon receipt of a "Notice of Award" or equivalent document, or on the first day of a class to which the faculty member makes a "major contribution." Upon notification of non-compliance by the Faculty Committee, a faculty member will be able to present to the Committee any mitigating circumstances that might lead the Committee to decide that no penalty should be imposed. Faculty who are still determined to be non-compliant after one year on probation will be dismissed from the program, subject to appeal.

Faculty may choose to become an ADJUNCT member of the GMB faculty. Adjunct membership precludes faculty from

taking GMB students, but allows the faculty to participate in all other GMB activities without the need to satisfy the requirements stated above. A faculty member in non-compliance for two years will be moved to Adjunct status. Faculty may move to Full status by meeting the requirements stated above.

ADMISSION OF STUDENTS

The Executive Committee or a separately appointed Recruiting Committee will serve as the admissions committee and will make admission recommendations to the Director.

Applicants must have a strong background in the biological and physical sciences. It is expected that applicants will have Graduate Record Examination (GRE) scores above the 75th percentile, a grade point average (GPA) equivalent to a "B" or better, and letters of recommendation that indicate a high level of motivation for scientific research. All other requirements of the Laney Graduate School and the Graduate Division of Biological and Biomedical Sciences must be met. Students are also expected to have some research experience.

RESPONSIBILITY OF FACULTY TO STUDENTS

Upon agreeing to take a student into their laboratory, faculty agree to mentor the student and provide the stipend for that student in the years that are not covered by the GDBBS. Taking a student into the laboratory requires approval by the Program Director and the Chair of the faculty's department to ensure compliance with the GDBBS policy manual, including the GDBBS Stipend Reserve regulations.

Faculty admitted to the GMB program who have not demonstrated previous training of Ph.D. students will be limited in accepting no more than an average of one GMB student/year for the first two academic years of their appointment into the program. Exceptions to this rule must be approved by the Executive Committee.

REQUIREMENTS OF STUDENTS

- **Coursework**

Details about the curriculum requirements can be found in **Appendix A1** (applicable to students entering Summer 2016 and later). The curriculum requirements for students who entered prior to 2016 can be found on the program website:

http://www.biomed.emory.edu/PROGRAM_SITES/GMB/academics/curriculum.html

Students matriculating Summer 2016 and later must successfully complete IBS 500R (Topics in Bioscience) within their first two years of graduate school. IBS 500R is a pre-requisite for IBS 574 (Computational Bio & Bioinformatics), which is **not** required, but highly recommended. Please keep in mind that IBS 500R is only offered in the fall semester each year.

Current students (or students who entered the program before 2016) are not required to take IBS 500R, but may enroll in the course if they wish.

All students must be registered for a minimum of 9 hours in each semester in order to maintain full-time enrollment status.

GMB T32 Trainees

During their graduate career (preferably in the second year) all T32 trainees must take one course from the courses listed below. This requirement ensures that trainees receive additional breadth in their foundation training, specifically in an area of quantitative biology and/or bioinformatics.

IBS 574 – Introduction to Computational Biology and Bioinformatics (Spring); credit 4 hrs.

BIOS 505 – Statistics for Experimental Biology (Spring); credit 4 hrs.

IBS 593 – Molecular Evolution (Spring); credit 4 hrs.

IBS 736 – Genetic Epidemiology (Fall); credit 3 hrs.

Additional courses that can fulfill the requirement include:

IBS 500r – Topics in Bioscience (Fall), credit 3 hrs.

IBS 591 – Population Biology and Evolution of Disease (Spring); credit 4 hrs.

IBS 592 – Quant. Methods in Population Genetics, Ecology, and Evolution (Spring); credit 4 hrs.

IBS 594 – Evolutionary Biology (Fall); credit 4 hrs.

Other courses may be supplemented with the permission of the T32 Director.

Grade Requirements

All GDBBS students must maintain a minimum GPA of 3.0 in each semester of graduate work. If a student's GPA is below 3.0 in any one semester of work, that student will be placed on academic probation and the student cannot receive a grade of less than B in any subsequent course. If a student's GPA falls below 3.0 in any two semesters of work, or if he/she receives one F or U grade in any course, that student will be dismissed from the Division. If a student who is dismissed believes there were extenuating circumstances that adversely affected his/her performance, he/she may submit to the Division Director a written appeal for consideration of reinstatement. The appeal should clearly outline the extenuating circumstances and must be submitted within one month of grades being recorded by the Office of the Registrar. The Program shall also submit a recommendation as part of the appeal. All appeals will be reviewed by the GDBBS Executive Committee. Students who receive a grade of less than a B in a core GMB course may need to repeat the course at the discretion of the Executive Committee. Students receiving a grade of less than B in their dissertation research will be put on academic probation and subject to dismissal if their performance does not show substantial improvement in the following semester.

GMB Seminars

All GMB students are required to attend the weekly GMB seminar during their entire tenure in the program. Students receive one credit hour each semester as IBS546R, and this course is graded as satisfactory (S) or unsatisfactory (U). Attendance is recorded by submitting two written questions for the seminar speaker on a form and submitting this to the DGS. If a student cannot attend a seminar, then the student is obligated to email the DGS before or soon after the seminar, explaining the reason for the absence. Legitimate (excused) absences include illness, death in the immediate family, or attendance at national or international scientific meetings. Each semester, a student is allowed only two unexcused absences. If a student has more than two unexcused absences, the grade will be U. A U in any course is a failing grade and can be grounds for dismissal from the program.

GMB Retreat

Attendance at the annual GMB retreat is a requirement for all GMB students. Students who cannot attend the retreat due to a professional conflict should contact the Director. Other excuses for missing the retreat will be considered on a case-by-case basis and should be discussed with the Program Director.

Ethics Training Requirements

1. LGS Requirement: Jones Program for Ethics

Students who entered in Fall 2012 and later must fulfill the Laney Graduate School's Jones Program in Ethics (JPE) requirement, which consists of courses, JPE 600 and 610. Refer to the JPE website for the current policies and schedule of course meetings: <http://gs.emory.edu/professional-development/jpe/index.html>.

2. GMB Requirements

Students in Years 1 and 2 will enroll in GMB 706 (Ethical Conduct of Research) in the Spring semester.

Additionally, students who entered in Fall 2012 or later are required to complete an ethics refresher course before the end of their 6th year of study.

Professional Development

GMB students are expected to be planning for their career options from the time they enroll until they complete their PhD dissertation. As an initial component of this planning, all students are required to have completed the web-based career planning tool that is available at myIDP.sciencecareers.org. In addition, all students are required to complete and present the short- and long-term planning "Meeting IDP Slides" templates available on the GMB website. The students are further strongly encouraged to attend any of the multiple workshops and presentations focusing on career options that are organized by the GDBBS and LGS throughout the year.

Directed Study

The purpose of Directed Study (GMB 797R) is to allow students the opportunity of specialized training in areas not represented by the current courses offered by either our program or other programs. According to Laney Graduate School policy, a student in advanced standing (second year and above) may apply only 5 hours of this course to their 36 hours of coursework needed in advanced standing to graduate.

- GMB students will normally be allowed only 5 hours of Directed Study.
- An outline of the directed study must be submitted to the DGS or the curriculum committee for approval prior to registration.
- To receive credit, a brief summary of the course must be submitted with the grade at the end of the semester (e.g., list of papers, experimental approaches, etc.).

- **Lab Rotations**

As per GDBBS policy, GMB students may perform their rotations and dissertation research in the lab of any faculty member who is a member of the GDBBS in good standing. Three (3) rotations are required and the choice of each rotation must be approved by the DGS.

No GMB faculty member may accept more than a total of three (3) GMB rotation students per academic year, and have no more than two (2) doctoral students from any graduate program rotating in their lab within any rotation period. Students may elect to rotate in additional labs but must select a laboratory for their dissertation research before the start of their second year. Exceptions must be approved by the Executive Committee and Program Director.

Within one week of ending each rotation, the student will submit a 3-6 page Rotation Report (not counting references). The format should be like a small paper with the usual sections of Abstract, Introduction, Materials and Methods, Results, Discussion, and Figures. The Results and Discussion sections can be combined. The head of the rotation lab should help in editing this document before it is submitted to the DGS. The Rotation Report will be evaluated by other faculty who served as advisors for other rotation students within the rotation period. At the end of each rotation, the head of the rotation lab will recommend a grade for the rotation to the DGS, partly based on the quality of this report. Rotation advisors must provide a justification when assigning rotation grades and provide feedback about the student's performance (i.e. strengths and weaknesses) to the student and DGS.

- **Dissertation Advisors**

At the end of the third rotation period, or no later than the end of the summer of the first year, a student should choose a dissertation advisor and submit that choice to the Program Director for approval.

Approval by the GMB Director requires that the faculty member sign the "GDBBS Dissertation Advisor Assignment Agreement" form, which includes a pledge for financial support from the faculty member's department chair. Final approval is made by the Director of the GDBBS. No GMB faculty member may take more than two GMB students per year into their lab.

Students entering labs of GDBBS but non-GMB faculty must request specific permission from the Director to do so. For approval, the faculty must be a Full member of the GDBBS, and must agree in writing to abide by the training policies for GMB students. Note that the student's requirements for the degree remain governed by the GMB program, and not the program with which the dissertation advisor is affiliated.

- **Comprehensive Qualifying Exam**

The GMB qualifying examination shall consist of two components: a Written Exam will cover basic concepts in genetics and molecular biology in a problem solving setting; and an Oral Exam will cover basic concepts in genetics, as well as concepts related to the student's program.

Timing of the Qualifying Exams

- **Early January, Year 2:** Written Exam
- **March 1, Year 2:** Deadline for Written Exam retakes
- **April 1, Year 2:** Deadline for students to submit their *approved* list of four committee member names to the GMB Oral Exam Chairperson

- **Second Half of May, Year 2:** Oral Exam
- **Before Start of Academic Year 3:** Deadline for completion of any Oral Exam retakes (recommended 4-6 weeks after original exam)

Qualifying Written Exam

Goal: The goal of the GMB Written Qualifying Exam is to ensure broad knowledge in Genetics and Molecular Biology. The exam will cover the basic mechanisms of molecular biology, prokaryotic and eukaryotic genetics, human genetics, developmental and population genetics at the level that these subjects were discussed and analyzed in the required courses.

Exam Format: Closed book setting, FIVE paired questions; students are required to answer one question from each pair. Students will have 5 hours to complete the exam. Exam questions will be solicited from the faculty membership; selection of questions and assembly of the Exam will be performed by the Written Exam committee.

Timing: The exam will be administered in early January before the start of Spring classes and will be graded within 1-2 weeks.

Grading: Each question will be graded by two GMB faculty members who will meet to discuss their grades if the scores they assign to any student differ by more than 3 points (out of 20 total).

Pass/Fail: A score of $\geq 70\%$ is required to pass the written exam; grades will be Pass or Fail.

Re-take: Students who do not pass the written exam on their first try but score $\geq 60\%$ will be offered the opportunity to "retake" the written exam. Students receiving a score of less than 60% must appeal to the GMB Executive Committee for approval to retake the Written Qualifying Exam. The "Retake Written Qualifying Exam" will be closed book, like the initial written exam, and will consist of 7 new questions, of which the student will be required to answer 5. A score of $\geq 70\%$ is required to pass. The re-take exam must be administered within 6 weeks after the original exam date.

Terminal Masters Degree: Students who do not pass the Qualifying Exams may petition the Executive Committee to be allowed to redirect their studies towards the completion of a terminal Masters Degree. Consideration for a Masters Degree will require a brief proposal from the student and a letter from the student's advisor. The advisor's letter will:

- provide a recommendation addressing the student's laboratory skills and expected progress;
- state the he/she believes the experimental plan will lead to a Masters Thesis;
- indicate the time to completion and a schedule of benchmarks that needs to be met; and,
- provide a source of support for the student if completion of the project will extend beyond the Spring semester.

The length of GDBBS funding for support of the student will be decided by the Executive Committee, but in no case shall GDBBS funding extend beyond the end of August of that year.

Students who pass the written exams and fail the oral exam, may also be eligible for a Masters Degree following the same conditions as described in 3.

All terminal Masters Degrees will follow the established GMB guidelines.

Qualifying Oral Exam

Goal: The purpose of the oral exam is to determine if a student has acquired an acceptable level of basic knowledge and is able to apply that knowledge in oral discussion to address scientific questions so that he/she may pursue a doctoral dissertation.

Examiners: Once a student has passed the Written Qualifying Exam the student will, in consultation with their advisor and subject to approval of the program DGS, select FOUR faculty members familiar with their field of research to serve on their dissertation committee. **The deadline for formation of the dissertation committee is**

February 15.

- In keeping with the GMB Guidelines at least THREE of these FIVE faculty members (advisor + FOUR committee members) must be GMB faculty members in full standing.
- The student will submit the approved list of FOUR committee member names to the GMB Oral Exam Chairperson by April 1st of their second year.
- The GMB Oral Exam Chairperson will assemble a team of FOUR faculty members to constitute an Oral Exam Committee for the student. Two of the faculty will be derived from the standing GMB Oral Exam Committee, and the remaining two faculty will be selected from the list of the Dissertation Committee members provided by the student to the Oral Exam Chairperson.

Before the Oral Exam: At least one full week before the scheduled oral exam the student will distribute copies of the following documents to all members of their Oral Exam Committee:

- a list of the Emory courses they have taken,
- their grade from the GMB Written Qualifying Exam, and
- a copy of their dissertation proposal (in the form of a grant written for the “grants class” during the spring semester).

Structure of the Oral Exam: The oral exam will begin with a 10-minute *uninterrupted* chalk-talk presentation by the student during which they are to introduce the essential background and rationale for their proposed research project, explain the aims and hypotheses to be tested, and outline the approaches to be applied and present any key preliminary data. After the 10-minute presentation the examiners will take turns around the table asking questions using a format of 10 minutes for each examiner to ask one-on-one questions followed by 5 min during which the other examiners may also ask questions related to that topic. Two full rounds of questioning with a brief break between the rounds will be conducted. Questions may address the proposed research topic or may be general in nature. The total time for the exam will be approximately 2 hrs 10 min, or with breaks, about 2 hrs 20 min. *The advisor’s role during the exam is solely as a witness. The advisor may not initiate or participate in discussions about the student’s performance before, during, or after the exam.*

Grading: At the conclusion of the exam the student and advisor will leave the room and the committee chair will ask each examiner for their initial vote of either Pass or Fail, to be submitted by secret ballot (slips of paper). If there is any disagreement the committee members will discuss the student’s performance and, as needed, verbally recast their votes. **A minimum of THREE of the FOUR committee members must vote “Pass” for the student to pass the Oral Exam.**

Retakes: Any student who fails the Oral Qualifying Exam on the first attempt but passed their Written Qualifying Exam on the first attempt may appeal to the GMB Executive Committee for a second attempt to pass the Oral Qualifying Exam. Any student who needed two attempts to pass the Written Qualifying Exam will be allowed only one attempt to pass the Oral Qualifying Exam, unless granted an exception by the GMB Executive Committee. Unless otherwise determined by the GMB Executive Committee the retake Oral Exam Committee for any given student will be the same committee that administered the initial Oral Qualifying Exam, and the format of the retake will be the same as for the initial Oral Qualifying Exam. A minimum of THREE of the FOUR committee members must vote “Pass” for the student to pass their Oral Exam retake. *A student must have passed both the Written and Oral Qualifying Exams in order to begin academic year 3 in the GMB program.*

- **Dissertation Proposal**

GMB students shall compose a proposal that outlines the aims, background, and experimental design of their dissertation research. The proposal may be produced as a requirement of the IBS 522r Grant Writing and Professional Development course. The proposal will be submitted to the student’s dissertation committee, which will be formed by April 1 or immediately after a student has passed their written qualifying exam. A copy of the dissertation proposal will also be submitted to all members of the student’s oral qualifying exam committee at least one full week before their scheduled oral exam. Students may receive advice on the contents of their proposal from any source, including their Dissertation Advisor. Dissertation committee members will provide critiques of the proposal and its content, with respect to organization, writing style, and the feasibility and value of the proposed science. The proposal format should conform to that used for the NIH Ruth L. Kirschstein Individual Predoctoral National Research Service Award (NRSA) award mechanism, or F31, application

(<http://grants1.nih.gov/grants/guide/pa-files/PA-11-112.html>). Students are encouraged to use these proposals as the basis of an application for extramural funding. In this regard, if the target agency requires an application that differs from the format described above, the student can petition their Dissertation committee to allow their proposal to conform to the agency-specific format, so long as that format retains the general information (hypothesis, project goals/research aims, research strategy) included in the format outlined above.

- **Candidacy**

Students who entered the program in 2016 or prior should apply for candidacy after passing their Comprehensive Qualifying Exam and completing 36 hours of advanced course credit hours (typically at the end of the third year). The deadline for reaching candidacy is August 1 before the fifth year.

Students who entered the program in 2017 or after should apply for candidacy after passing the Comprehensive Qualifying Exam but before September 15 of their fourth year. Students are eligible for candidacy after meeting the following requirements:

- Complete all program requirements for candidacy: coursework and other training required by the degree program, including program required JPE training
- Earned 54 credit hours at the 500 level or above
- Select Dissertation Committee and submit LGS Dissertation Committee Form
- Complete TATT 600, TATT 605, and JPE 600
- Resolve any Incomplete (I) or In Progress (IP) grades
- Be in good standing with a minimum cumulative GPA of 3.0

More details on candidacy may be found at <http://www.gs.emory.edu/academics/policies/candidacy.html>.

Students who do not meet the candidacy deadline will be placed on academic probation, will not be eligible for PDS funds, and may forfeit financial support. These sanctions will be lifted when the student enters candidacy.

- **Dissertation Committee Meetings**

The dissertation committee must consist of 5 members of which 3 are members of the GMB program.

The purpose of these meetings is to evaluate the progress of the student towards obtaining a Ph.D. This includes progress in coursework and research.

The first dissertation committee meeting must occur before December 15 of the student's third year. Dissertation committee meetings must occur at least twice every academic year. Students in their sixth year and beyond must have dissertation committee meetings at least every four months (fall, spring, and summer semesters). Satisfactory progress is required for stipend continuance. An "It is expected that the following will be completed at the next meeting," series of statements should be planned at these meetings and entered into the Dissertation Committee form. Completion of these objectives will be deemed satisfactory progress.

In scheduling Dissertation Committee meetings, students are allowed to have only one committee member absent from the meeting. In those cases, the student must meet with the absent committee member within two (2) weeks, in order to both consult on progress and get the Dissertation Committee meeting form signed.

Within two (2) weeks of the Dissertation Committee meeting taking place, the student must submit to the PA the appropriate form documenting that the Dissertation Committee has met and approved the student's progress. The form must include comments from the advisor making clear statements regarding expectations for student progress over the period leading to the next Dissertation Committee meeting. (In addition, the student should make sure that those comments are addressed at the next Dissertation Committee meeting.)

M.D./Ph.D. students should have their first committee meeting at the beginning of their second year. Committee meetings must occur in both the Fall and Spring semesters.

Dissertation Proposals should be updated yearly with a progress report section and distributed to their dissertation committees prior to each committee meeting, along with any manuscripts or papers published that the student has completed. The progress report should include two PowerPoint slides that outline the student's short-term and long-

term goals, as part of the student's Individual Development Plan (IDP). Comments of the committee should be placed on the GMB Dissertation Committee Form and sent along with the proposal and/or progress reports to the DGS.

- **Dissertation Completion Time**

Students are expected to complete their dissertations and apply for their degrees within six (6) years. If a student has not completed the degree at the end of the seventh (7) year, the program may grant a one-year extension. If a student has not completed the degree at the end of the eighth (8) year, the student may continue work for at most one additional year and only with approval from the Dean.

This policy is effective for students entering the program in 2017. Students who entered the program prior to 2017 will adhere to the policy that existed at the time they started.

For full details and most up-to-date information, including instructions and deadlines for obtaining approvals for completion time extensions, please read the LGS Handbook: <http://gs.emory.edu/handbook/>

- **Dissertation & Defense**

Each student will be expected to submit a written dissertation in compliance with the requirement of the Laney Graduate School. The dissertation is based on research proposed and done by the student. Students must adhere to the following steps to prepare for defending:

- 1) The faculty advisor will submit to the student's committee an *advisor-approved* draft of the dissertation. This submission should be copied to the PA to confirm the thesis has been submitted.
- 2) After the advisor-approved draft of the thesis has been provided to the committee, the student can then begin the process of scheduling the defense, which must be a minimum of two (2) weeks *after* the committee receives the advisor-approved draft.
- 3) Once the committee members all agree to a specific time and date for the defense, the Program Administrator works with the student to officially schedule the defense at the agreed upon date and time. This process involves the following:
 - a) The student must obtain all required signatures for the "Dissertation Defense Permission Form" and must submit the form to the DGS and PA as soon as possible, at least two (2) weeks prior to the defense date. *Notes:* Defense must be scheduled at a time where all the student's committee members are able to attend. The time of the defense should be between 9 AM and 4PM and should not conflict with a GMB scheduled event. The student is responsible for securing the room reservation.
 - b) At least two weeks prior to the defense, student must also submit to the PA his/her flyer announcing the dissertation title, date, time, and location of the defense. The "GDBBS Defense Flyer" template can be found at <https://secure.web.emory.edu/biomed/intranet/students/index.html>. The flyer must be distributed university-wide and publicly at least two (2) weeks prior to the defense. Therefore, if the student does not submit the "Dissertation Defense Permission Form" and the customized "GDBBS Defense Flyer" to the PA in a timely fashion, the student will need to reschedule the defense.
 - c) At least one week prior to the defense, student must submit the defense program, which includes the abstract, publications, presentations, dissertation committee, etc., by sending the customized "GDBBS Defense Program" to the PA for program-wide distribution. The template can be found at <https://secure.web.emory.edu/biomed/intranet/students/index.html>.
- 4) Student defends on the agreed upon defense date/time by orally presenting his/her results at an open seminar. After a period of open discussion, the committee proceeds with a closed examination of the student and his/her work.
- 5) If the written dissertation is judged acceptable and the student passes the oral examination, the committee signs
 - a) the "Doctoral Completion Form" (found here: <http://www.graduateschool.emory.edu/academics/completion/index.html>) and student submits it to the LGS; and
 - b) the "Committee Approval of the Oral Defense Examination" Form and students submits it to

the GDBBS.

- 6) Additional steps, specific to the LGS, toward officially completing the degree must be taken and can be found on the next section below.

- **Degree Completion**

Along with the above steps for defending, students must complete the Degree Application and submit it to the Laney Graduate School by the degree application deadline for the semester in which they plan to defend and graduate. Students must also visit the LGS Degree Completion page and follow all instructions for submitting their dissertation, as well as submitting the LGS required forms for graduating: <http://www.graduateschool.emory.edu/academics/completion/index.html>. Any questions regarding the degree completion process must be directed to Monica Taylor (mtay102@emory.edu) in the GDBBS office or Renee Webb (rlwebb@emory.edu) in the LGS office.

- **Publication Requirements**

The GMB program recognizes that each individual dissertation represents individual challenges, yet publications are a clear and measurable record of a student's productivity that impacts the student's future goals. It is the *expectation* that all students will have accomplished an original, significant, and scholarly body of work before the defense of the dissertation. The dissertation work should thus result in multiple publications with the students as the first author. It is therefore unlikely that the dissertation defense will be approved in the absence of at least one significant original research paper accepted for publication by a credible professional journal.

- **Terminal Master's Degree**

In the event that a student cannot complete the requirements to complete a Ph.D., they may apply for a Master's Degree. Award of the Master's Degree will require that 1) the student passes the written qualifying exam; 2) the student is in good academic standing; and 3) the student completes a written thesis and thesis oral exam. Consideration for a Master's Degree will require a brief proposal from the student and a letter from the student's advisor regarding the suitability of the student to complete a Master's thesis. The Executive Committee will evaluate the feasibility of the Master's proposal, and it is at the discretion of the Executive committee to approve or deny the Master's proposal. If the proposal is approved, completion and defense of the Master's thesis has to occur within 1 year of the date of approval. It is assumed that the scope and depth of the Master's thesis is significantly less than that of the Ph.D. dissertation.

- **Grievance Policy**

A student who has a grievance related to some aspect of his/her progress in the GMB program should report it to the DGS. The student should describe the grievance and relevant details in a letter addressed to the DGS, who will try, if possible, to resolve the grievance in conversation with the student and relevant parties. If this is not successful, the Director will appoint a committee of three GMB faculty members (or faculty members outside the GMB program if the situation warrants) or use the existing Executive Committee if appropriate, who will review the grievance and propose an appropriate response. If it is impossible to resolve the grievance within this committee or within the framework of the GMB program's administrative structure, the GMB Program Director will forward the grievance to the Director of the GDBBS. From this point forward, the grievance will be handled according to the Grievance Procedure outlined in the Laney Graduate School Handbook. If the issue is with the GMB Program Director, the student should go directly to the GDBBS Director or the Senior Associate Dean of the Laney Graduate School if there is a conflict with the GDBBS Director.

- **Laney Graduate School & Graduate Division of Biological and Biomedical Sciences Policies**

Refer to the current Laney Graduate School Handbook (<http://www.gs.emory.edu/academics/policies/index.html>) & Graduate Division of Biological and Biomedical Sciences Handbook (<https://secure.web.emory.edu/biomed/intranet/handbooks/index.html>) for additional policies such as:

- Minimum Degree Requirements
- Teaching Assistant Training and Teaching Opportunity (TATTO) Program
- Jones Program for Ethics (JPE)
- Professional Development Support Funds
- Withdrawals and Leaves of Absence
- Parental Accommodation Policy

- Degree Completion & Graduation

GMB GUIDELINES FOR THE COMBINED M.D./PH.D. DEGREE PROGRAM

Last Amended: July 2016

A. Participation in GMB Program

Medical Scientist Training Program (MSTP) students choose a dissertation research advisor and a graduate Program under the guidelines of the MSTP Program. Unless otherwise specified, the MSTP student is expected to fulfill all the requirements for the degree and participate fully in the GMB Program. MSTP students are subject to the rules outlined by the GMB Guidelines (see above).

Because MSTP students enter the GMB program in the middle of the M2 academic year, the core course of study differs from that of PhD-only students. Participation in IBS546r (Presenting Genetics - spring of M2 and all of G1), GMB 706 (Ethical Conduct in Research - 2 spring semesters), IBS 500r (Topics in Bioscience – Fall of G1), IBS 522r (Grant Writing and Prof. Develop. – fall or spring of M2. Must be taken before the oral qualifying exam), TATTO (August prior to G1) and IBS699r (Dissertation Research - all semesters) is the same for MSTP and PhD-track GMB students. The curriculum is described below but it is important that new students meet with the DGS to avoid any possible confusion.

B. Coursework

MSTP students are admitted to the Graduate Program in Advanced Standing and are required to complete 16 additional hours of coursework, which include the required participation in IBS546r, GMB 706, IBS 500r, IBS 522r, and TATTO. The minimum course requirements consist of two core courses (from list below). Additional courses (optional electives) may be taken, but are not required. MSTP students are expected to start coursework as close to the beginning of the Spring semester of M2 as possible but no later than one week following completion of their board exams, around the end of January.

Core Courses - *At least 2 of the following core courses are required in addition to the aforementioned courses above:*

- IBS 561 (Eukaryotic Chromosome Function)
- IBS 574 (Computational Biology and Bioinformatics)
- IBS 593 (Molecular Evolution, odd years)
- IBS 560 (Model Genetic Systems)
- IBS 504 (Prokaryotic Genetics)
- IBS 746 (Graduate Human Genetics)

Optional Electives:

In addition to the required coursework, MSTP students may, but are not required to, take any course under the IBS code or BIOS 506 and 507. Any of the core courses would be eligible as would the following common choices:

- BIOS 506 (Biostatistical Methods I)
- BIOS 507 (Applied Linear Models)
- IBS 555 (Biol/Biomed Sci I)
- IBS 560 (Model Systems)
- IBS 515 (Current Topics)
- IBS 556 (Biol/Biomed Sci II)

Requests for exceptions to these course requirements and requests to enroll in courses outside the IBS series (with the exception of BIOS 506 and 507) must be approved by the Program Director and DGS of the GMB Program.

C. Qualifying Exams

MSTP students must pass a two-part Oral Qualifying exam and may choose to take the exam either at the end of Fall (Option B) or Spring (Option A) of G1 (provided they have completed IBS522r). Part 1 (one hour) of the exam will focus on general knowledge and will substitute for the written general knowledge exam taken by PhD-track GMB students. Examiners will take turns asking questions using a format of 10 minutes for each examiner to ask one-on-one questions followed by 5 min during which the other examiners may also ask questions related to that topic. Part 2 will use the same structure as the PhD-track GMB student's Oral exam- using the student's research proposal from IBS522r as a starting point. Part 2 will begin with a 10-minute *uninterrupted* chalk-talk presentation by the student during which they are to introduce the essential background and rationale for their proposed research project, explain the aims and hypotheses to be tested, and outline the approaches to be applied and present any key preliminary data. After the 10-minute presentation the examiners will take turns around the table asking questions using a format of 10 minutes for each examiner to ask one-on-one questions followed by 5

min during which the other examiners may also ask questions related to that topic. Students must pass both Part 1 and Part 2. The Exam committee will cast independent votes for the two parts. A minimum of three of the four committee members must vote “Pass” for the student to pass each part. The exam committee will be comprised by at least two members of the student’s thesis committee and two members of the GMB Oral Exam committee. Any modifications of the above policies may be granted on a case by case basis by the GMB Director.

Retakes: MSTP students may be required to retake Part 1, Part 2 or both parts of the Qualifying Exam. Unless otherwise determined by the GMB Executive Committee, the retake Exam Committee for any given student will be the same committee that administered the initial Exam, and the format of the retake will be the same as for the initial Qualifying Exam. A minimum of three of the four committee members must vote “Pass” for the student to pass their Exam retake. MSTP students taking the Exam at the end of the G1 Fall semester, do so without bias meaning they may retake the relevant part of the exam up to two additional times. The Exam Committee should recommend either a retake within 8-12 weeks, or remediation at the discretion of the Committee. MSTP students taking the Qualifying exam at the end of the G1 Spring semester, along with the PhD track GMB students, may retake the relevant part of the Exam one time. All MSTP students must pass both components of the Qualifying Exam by the beginning of the G2 year.

D. Teaching Requirement

The teaching requirement of the Graduate School is to be fulfilled by the end of the MSTP student’s G2 year. Exceptions to meet the teaching requirement beyond the G2 year will be granted on a case by case basis.

Appendix A1. GMB Course Requirements

(applicable to students entering Summer 2016 and later)

All students must be enrolled in a minimum of 9 credit hours per semester to be a full-time student. For 1st and 2nd year students, a reasonable course load is 11-14 credit hours per semester. Consult your DGS or PD to choose electives.

All students are required to take the following core courses: IBS 555, IBS 561, IBS 515, IBS522r, and IBS 500r.

The table below lists out the sequence in which students should complete these core courses.

In addition, students must also successfully complete the following requirements by the end of Year 2, but have some flexibility in when they choose to complete them:

- IBS 500r (Topics in Bioscience, 3 hrs) is required for all students entering Summer 2016 and later. It is also a pre-requisite for IBS 574 (Comp Bio & Bioinformatics, 4 hrs), which is *not* required, but highly recommended. IBS 500r is only offered in the fall semester. Note: if you have not taken a Biostats course before, you will need to take BIOS 505 before IBS 500r, which is offered only in the spring semester.
- Students must also take **one** of the following courses before the end of Y2, which are only offered in the fall semester (note: many students take more than one of these):
 - o IBS 504 (Prok Mol Genetics, 6 hrs)
 - o IBS 560 (Model Genetic Systems, 4 hrs)
 - o IBS 746 (Grad Human Genetics, 4 hrs)

Year 1 Fall	Year 1 Spring
Core courses: IBS 546r (Presenting Genetics) 1 hr IBS 555 (Basic Biomed & Biol Sci) 6 hrs GMB 597r (Lab Rotations) VC (select 3+ hrs) ^JPE 600 (LGS Ethics Class) 0 hrs	Core courses: IBS 546r (Presenting Genetics) 1 hr IBS 570r (Intro Grad Seminar) 2 hrs IBS 597r (Lab Rotations) VC (select 3+ hrs) GMB 706 (Ethical Conduct) 1 hr IBS 561 (Euk Chromosome Funct) 4 hrs
Year 2 Fall	Year 2 Spring
Core courses: IBS 515 (Topics Mol Genetics) 2 hrs IBS 546r (Presenting Genetics) 1 hr IBS 699r (Adv Graduate Research) VC (select 3+ hrs) ^TATT 600 (TA Training) 0 hrs	Core courses: IBS 522r (Grant Writing & Pro Dev) 4 hrs IBS 546r (Presenting Genetics) 1 hr IBS 699r (Adv Graduate Research) VC (select 3+ hrs) GMB 706 (Ethical Conduct) 1 hr ^TATT 605 (Teaching Assistantship) 0 hrs
Year 3 Fall (before candidacy)	Year 3 Spring (before candidacy)
Core courses: IBS 546r (Presenting Genetics) 1 hr IBS 699r (Adv Graduate Research) VC (select 8+ hrs)	Core courses: IBS 546r (Presenting Genetics) 1 hr IBS 699r (Adv Graduate Research) VC (select 8+ hrs)
Year 4+ Fall (after candidacy)	Year 4+ Spring (after candidacy)
Core courses: IBS 546r (Presenting Genetics) 1 hr GMB 799r (Dissertation Research) VC (select 8+ hrs)	Core courses: IBS 546r (Presenting Genetics) 1 hr GMB 799r (Dissertation Research) VC (select 8+ hrs)

[^] LGS will register you for these courses

VC = Variable Credits (system defaults to 1 hour, change to correct number)

Suggested Course Schedules

If you want to focus on wet lab experimentation:

Year 1 Fall		Year 1 Spring	
IBS 500r (Topics in Bioscience)	3 hrs	IBS 546r (Presenting Genetics)	1 hr
IBS 546r (Presenting Genetics)	1 hr	IBS 561 (Euk Chromosome Funct)	4 hrs
IBS 555 (Basic Biomed & Biol Sci)	6 hrs	IBS 570r (Intro Grad Seminar)	2 hrs
GMB 597r (Lab Rotations)	VC (select 3+ hrs)	IBS 597r (Lab Rotations)	VC (select 3+ hrs)
^JPE 600 (LGS Ethics Class)	0 hrs	GMB 706 (Ethical Conduct)	1 hr
And one of the following:		IBS 574 (Comp Bio & Bioinform)	4 hrs
IBS 504 (Prok Mol Genetics)	6 hrs		
IBS 560 (Model Genetic Systems)	4 hrs		
IBS 746 (Grad Human Genetics)	4 hrs		
Year 2 Fall		Year 2 Spring	
IBS 515 (Topics Mol Genetics)	2 hrs	IBS 522r (Grant Writing & Pro Dev)	4 hrs
IBS 546r (Presenting Genetics)	1 hr	IBS 546r (Presenting Genetics)	1 hr
IBS 699r (Adv Graduate Research)	VC (select 3+ hrs)	IBS 699r (Adv Graduate Research)	VC (select 3+ hrs)
^TATT 600 (TA Training)	0 hrs	GMB 706 (Ethical Conduct)	1 hr
And one of the following:		^TATT 605 (Teaching Assistantship)	0 hrs
IBS 504 (Prok Mol Genetics)	6 hrs		
IBS 560 (Model Genetic Systems)	4 hrs		
IBS 746 (Grad Human Genetics)	4 hrs		

Same focus as above, but if you do not have sufficient background to take IBS 500R in Year 1 Fall:

Year 1 Fall		Year 1 Spring	
IBS 546r (Presenting Genetics)	1 hr	IBS 546r (Presenting Genetics)	1 hr
IBS 555 (Basic Biomed & Biol Sci)	6 hrs	IBS 561 (Euk Chromosome Funct)	4 hrs
GMB 597r (Lab Rotations)	VC (select 3+ hrs)	IBS 570r (Intro Grad Seminar)	2 hrs
^JPE 600 (LGS Ethics Class)	0 hrs	IBS 597r (Lab Rotations)	VC (select 3+ hrs)
And one of the following:		GMB 706 (Ethical Conduct)	1 hr
IBS 504 (Prok Mol Genetics)	6 hrs	BIOS 505 (Stats for Experimental Bio)	4 hrs
IBS 560 (Model Genetic Systems)	4 hrs		
IBS 746 (Grad Human Genetics)	4 hrs		
Year 2 Fall		Year 2 Spring	
IBS 515 (Topics Mol Genetics)	2 hrs	IBS 522r (Grant Writing & Pro Dev)	4 hrs
IBS 546r (Presenting Genetics)	1 hr	IBS 546r (Presenting Genetics)	1 hr
IBS 699r (Adv Graduate Research)	VC (select 3+ hrs)	IBS 699r (Adv Graduate Research)	VC (select 3+ hrs)
^TATT 600 (TA Training)	0 hrs	GMB 706 (Ethical Conduct)	1 hr
IBS 500R (Topics in Bioscience)	3 hrs	^TATT 605 (Teaching Assistantship)	0 hrs
		IBS 574 (Comp Bio & Bioinform)	4 hrs

If you want to focus on dry lab quantitative experimentation or if you already have a strong quantitative background:

Year 1 Fall		Year 1 Spring	
IBS 500r-03R (Topics in Bioscience)	3 hrs	IBS 546r (Presenting Genetics)	1 hr
IBS 546r (Presenting Genetics)	1 hr	IBS 570r (Intro Grad Seminar)	2 hrs
IBS 555 (Basic Biomed & Biol Sci)	6 hrs	IBS 597r (Lab Rotations)	VC (select 3+ hrs)
GMB 597r (Lab Rotations)	VC (select 3+ hrs)	GMB 706 (Ethical Conduct)	1 hr
^JPE 600 (LGS Ethics Class)	0 hrs	BIOS 511 (Statistical Inference I)	4 hrs
BIOS 510 (Intro to Probability Theory)	4 hrs	IBS 574 (Comp Bio & Bioinform)	4 hrs
Year 2 Fall		Year 2 Spring	
IBS 515 (Topics Mol Genetics)	2 hrs	IBS 522r (Grant Writing & Pro Dev)	4 hrs
IBS 546r (Presenting Genetics)	1 hr	IBS 546r (Presenting Genetics)	1 hr
IBS 699r (Adv Graduate Research)	VC (select 3+ hrs)	IBS 699r (Adv Graduate Research)	VC (select 3+ hrs)
^TATT 600 (TA Training)	0 hrs	GMB 706 (Ethical Conduct)	1 hr
Elective (choose 1):		^TATT 605 (Teaching Assistantship)	0 hrs
IBS 504 (Prok Mol Genetics)	6 hrs	IBS 561 (Euk Chromosome Funct)	4 hrs
IBS 560 (Model Genetic Systems)	4 hrs		
IBS 746 (Grad Human Genetics)	4 hrs		

If you want to focus on dry lab quantitative experimentation, but do not have a strong quantitative background:

Year 1 Fall		Year 1 Spring	
IBS 500r-03R (Topics in Bioscience)	3 hrs	IBS 546r (Presenting Genetics)	1 hr
IBS 546r (Presenting Genetics)	1 hr	IBS 561 (Euk Chromosome Funct)	4 hrs
IBS 555 (Basic Biomed & Biol Sci)	6 hrs	IBS 570r (Intro Grad Seminar)	2 hrs
GMB 597r (Lab Rotations)	VC (select 3+ hrs)	IBS 597r (Lab Rotations)	VC (select 3+ hrs)
^JPE 600 (LGS Ethics Class)	0 hrs	GMB 706 (Ethical Conduct)	1 hr
		IBS 574 (Comp Bio & Bioinform)	4 hrs
Year 2 Fall		Year 2 Spring	
IBS 515 (Topics Mol Genetics)	2 hrs	IBS 522r (Grant Writing & Pro Dev)	4 hrs
IBS 546r (Presenting Genetics)	1 hr	IBS 546r (Presenting Genetics)	1 hr
IBS 699r (Adv Graduate Research)	VC (select 3+ hrs)	IBS 699r (Adv Graduate Research)	VC (select 3+ hrs)
^TATT 600 (TA Training)	0 hrs	GMB 706 (Ethical Conduct)	1 hr
BIOS 510 (Intro to Probability Theory)	4 hrs	^TATT 605 (Teaching Assistantship)	0 hrs
And one of the following:		BIOS 511 (Statistical Inference I)	4 hrs
IBS 504 (Prok Mol Genetics)	6 hrs		
IBS 560 (Model Genetic Systems)	4 hrs		
IBS 746 (Grad Human Genetics)	4 hrs		