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# MMBIO GRADUATE HANDBOOK

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2021-2022



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# **MMBIO GRADUATE PROGRAMS SUMMARY**

The Microbiology and Molecular Biology Department offers two graduate degrees:

- Doctor of Philosophy (PhD) in Microbiology and Molecular Biology
- Master of Science (MS) in Microbiology and Molecular Biology

The MS and PhD programs emphasize a combination of research experience and interdisciplinary course work. Research emphases include gene regulation, host-microbe recognition processes, virus and phage biology, microbial physiology, immunology, cancer biology, and medical informatics. The PhD degree additionally requires the ability to independently recognize opportune scientific problems and to craft multidimensional research proposals. PhD students are responsible for the creation of a substantial body of research findings, and publication of these findings in prominent scientific journals. Completion of the MS or PhD degree prepares graduates for further study at the PhD or postdoctoral level; or for employment in academic, private-sector, or government-funded research, development and teaching endeavors.

## **PhD DEGREE REQUIREMENTS**

### LENGTH OF TIME TO COMPLETE DEGREE

Five years (usual time); eight years (university limit)

### CREDIT-HOURS

- PhD after BS: 54 credit-hours total (At least 18 didactic credit-hours, 18-20 research credit-hours, and 18 dissertation credit-hours)
- PhD after MS: 36 credit-hours total (18-coursework & Research, 18-dissertation)

### COURSE REQUIREMENTS

- BIO 503, Research Orientation, 1 credit, offered fall only
- MMBIO 661, Molecular Biology of the Cell, 3 credits, offered fall only
- MMBIO 663, Articulating Science, 2 credits, offered winter only
- MMBIO 665, Genomics 3 credits, offered winter only
- MMBIO 691R, Graduate Seminar, 2 credits (1 per semester), offered fall and winter  
(Attend every fall & winter semester, but only register for it two times for two total credit hours)
- MMBIO 692R Research in Progress, 2 credits (1 per semester), offered fall and winter  
(Attend every fall & winter semester, but only register for it two times for two total credit hours)
- MMBIO 695R, Research (18-20 credits)
- MMBIO 799R, PhD Dissertation (18 credits)
- Graduate Elective courses, 3-6 credits, as approved by committee  
(For a listing of MMBIO graduate courses offered, see page 26 in this Handbook)

### RESEARCH REQUIREMENT

To obtain the PhD degree, the student must generate a substantial body of research findings. The determination of sufficient productivity is left to the advisory committee, as it adheres to the following general guidelines:

- The student is expected to publish multiple first-author papers in reputable peer-reviewed journals prior to the dissertation defense;
- In some cases, the student may have only one first-author publication in a reputable peer-reviewed journal prior to the dissertation defense, as long as significant progress toward a second publication is evident.
- In no case can a student defend his or her dissertation without at least one first-author paper that is either published or in press by the dissertation defense date.

### FORMATION OF ADVISORY COMMITTEE

The advisory committee advises, directs, and approves the graduate student's program, both the academic work and the research work. Each committee member, is involved in training and mentorship of assigned students. Careful evaluation, rigorous review of student research and instruction, and regularly scheduled meetings can ensure a quality experience. Students should feel free to meet with committee members individually or as a group as frequently as help and advice are needed. The student takes the initiative in the formation of the committee, and in scheduling

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semi-annual progress review meetings, which take place during the first half of November and during the first half of May.

The student is initially assigned to be advised by the MMBIO graduate coordinator, until the permanent advisory committee is established. If students have not chosen their faculty advisor by the November progress review meeting, the student should hold this first November meeting with the MMBIO graduate coordinator and two additional temporary committee members. The student must choose a permanent graduate advisory committee by the 2<sup>nd</sup> progress report (May of the first year). Members comprising the advisory committee are selected by the student in consultation with the committee chair (the student's research advisor). The advisory committee is formally organized as approvals are given on the webpage <https://gradprogress.sim.byu.edu/> (GRADPROG), under the Committee section.

The PhD advisory committee is comprised of at least four faculty members. The committee chair is the student's research advisor. Students are encouraged to invite one faculty member from a non-MMBIO department to participate on this advisory committee, though this is no longer a requirement.

All members of the committee should be present at semi-annual progress review meetings, including the prospectus approval meeting held in November of the 2<sup>nd</sup> year. If one member cannot attend, then the student can talk with that member individually to give updates and get signatures, if the advisor approves. However, for the qualifying exam and dissertation defense meeting, all members must be present. For these two key exams, committee members may attend remotely, via Zoom or some similar videoconferencing technology.

### PROGRAM OF STUDY

The Program of Study is a list of courses that meet both the program's requirements and the student's personal area of focus and interest. This list is determined by the student in consultation with the advisory committee. Most courses should be completed within the student's first year in the program. The Program of Study form also establishes the composition of the student's advisory committee.

The Program of Study is submitted by the student and approved by the committee on the webpage <https://gradprogress.sim.byu.edu/> (GRADPROG), under the Program of Study section. It is due immediately after the 2<sup>nd</sup> progress review (May of first year). If it becomes necessary to alter the course plan or the composition of the advisory committee, the student or graduate secretary can make changes and then each member of the committee on the GRADPROG website must approve it.

Students desiring to take classes not on their Program of Study list need to get their advisor's approval before registering. The student may be required to pay for the cost of tuition for such courses.

### SEMI-ANNUAL PROGRESS REVIEW MEETINGS

In November and May of each year (between the 1<sup>st</sup> and 15<sup>th</sup> of each month), graduate students meet with their advisory committee in a formal progress review meeting. Ideally, this meeting

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will last approximately 30 minutes. Other settings would be more appropriate for highly detailed discussions on research strategies. The student is responsible for scheduling the time and location of the meeting, and providing appropriate online Adobe Sign forms (including the standard progress review form. These forms are available upon request of the graduate secretary. The student's advisor conducts the meeting. The progress review meeting agenda is as follows:

- 10-minute PowerPoint presentation by the student, with minimal interruption from committee members (formatting for this presentation is detailed below)
- 10-minute discussion with committee
- 3-minute deliberation by committee, with the student outside the room
- 5-minute follow-up discussion with the student, where the verdict (satisfactory/marginal/unsatisfactory) is announced and the student is given further advisement about how to proceed in coming months.
- The student ensures forms are signed by committee members, approved by the graduate coordinator, and returned to the graduate secretary

Format for the 10-minute student presentation:

- **Key Indicators:** 1 slide entitled "Key indicators" detailing start date in the program, anticipated graduation date, courses completed, current and future courses, current GPA, and the following data for the past 6 months: hours/wk of research-related activities, percent attendance to RIP, percent attendance to seminars, TA responsibilities, and publications/presentations.
- **Context:** 1-2 slides to provide context and background information relevant to the research project.
- **Central Questions:** 1 slide entitled "Central Questions" setting forth the central question(s) addressed in the research project. After each question, list approaches being used to address the question. This should all fit on a single slide.
- **Results and troubleshooting:** 5-8 slides showcasing progress toward addressing the central questions, including barriers to progress and alternative approaches.
- **Plans:** 1 slide outlining research plans for the next six months.

Progress review meetings may serve multiple functions during the first two years:

- **The Program of Study** (see above) must be approved in progress review #2 (May of first year)
- **The Prospectus** (see below) must be presented and approved in progress review #3 (November of second year)
- **The Qualifying Exam** (see below) must be conducted during progress review #4 (May of second year) *Note, this meeting is conducted by the committee exam chair, which is the one who is longest in the MMBIO department who is not the student's advisor.*

In every semi-annual progress review, a student's progress is rated "Satisfactory," "Marginal," or "Unsatisfactory" by the committee. A satisfactory rating recommends continuation in the program.

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Marginal or unsatisfactory ratings require the committee to list the changes and requirements a student needs to meet within a specified period of time, to remedy the problem(s). Two consecutive marginal/unsatisfactory ratings result in termination of student's program. When no evaluation is submitted, the university considers this "unsatisfactory."

Examples of Marginal or Unsatisfactory Progress:

- Not completing requirements from a previous unsatisfactory/marginal evaluation
- Grade below 2.0 in any class
- Failed to pass Qualifying/Coursework Exam or Oral Defense
- Not spending sufficient time in the laboratory to accomplish research
- Not attending RIP meetings, seminars, or graduate retreat
- Not progressing in the program, such as no results in experiments or no papers written
- Not being able to state any accomplishments since the last progress review
- Not submitting program of study, prospectus, etc. when it is due
- If admitted provisionally, not completing the provisions

## PROSPECTUS

Plans for the prospectus should be formulated by the student in consultation with, and then approved by, the advisory committee. The prospectus is the student's research proposal, and ideally, it becomes the outline of the student's dissertation.

A general format for the written prospectus would include

- Background information, significance, and project justification
- Clear statement of key questions and hypotheses being tested
- Experimental plan, including alternatives if planned approaches fail
- Expected results and timeline
- Bibliography

Generally, a dissertation prospectus will be 10 to 15 pages in length (single spaced with figures and tables, excluding the bibliography).

The prospectus approval meeting should be conducted as follows:

- The student is responsible for scheduling the time and place of the meeting, as for all progress review meetings.
- The student provides the written prospectus (electronically) to all committee members at least 7 days before the approval meeting.
- Committee members are expected to be familiar with the details of the prospectus prior to the meeting
- The student will orally present with minimal interruption by committee members, using the following format: 1 slide summarizing key indicators (see instructions for semi-annual progress review meetings, above); 1 slide summarizing research progress in the last 6 months; 5 slides to summarize the prospectus, bearing in mind that the committee has read the prospectus in its entirety. This presentation should last between 5 and 10 minutes.
- Committee members will lead a 15-minute discussion focusing on strengths and weaknesses of the proposal.

## PhD Degree Requirements

- The student will be excused for deliberation
- The student will be invited back to receive feedback from the committee relating to the progress review outcome (satisfactory/marginal/unsatisfactory) and approval of the prospectus. In many cases, the prospectus will be approved with qualifications, which may include significant revisions to the written document. Committee members will detail what these revisions are to accomplish, and how the qualifications will be approved.

Prospectus approval is formalized by a digitally signed copy of the Adobe Sign Prospectus form, which can be obtained upon request from the graduate secretary. This form must be filled out and digitally signed by the student before the progress review meeting along with Form A. Students must upload a digital copy of the prospectus to the Prospectus section of GRADPROG <https://gradprogress.sim.byu.edu/>. The deadline for the prospectus is progress review #3 (November of the 2<sup>nd</sup> year) for PhD students.

### QUALIFYING EXAM

The qualifying exam advances a PhD student to candidacy. It should be taken no later than the student's fourth progress report (May of their second year). This is an important make-or-break event on the path to a PhD. The qualifying exam requires students to identify interesting phenomena in diverse areas of biology, to propose models to explain these phenomena, and to design sound experiments to test these models. The exam also requires students to demonstrate familiarity with core theoretical and experimental principles learned in their coursework and elsewhere.

The Qualifying Exam consists of two parts:

1. Outside grant proposal.

The student writes up three preliminary proposal summaries, each of which may not exceed 1 page in length. These preliminary proposals will explore problems that are distinct from the student's research work and should involve diverse analytical systems. The three preliminary proposals are sent electronically to the advisory committee during the last week in April. Committee members will then deliberate by email about which of the three pre-proposals will be chosen for the student to expand upon. This correspondence will be led by the committee exam chair, which is the one who is longest in the MMBIO department who is not the student's advisor. The committee may propose adjustments to the experimental aims and approaches set forth by the student. The exam chair will notify the student of the committee's decision, at which time the student will write the full grant proposal (using NIH or NSF format) within two weeks. During this time period, all work must be done independently. This full-length proposal is submitted electronically to the committee in mid-May. The oral exam is to be held approximately 7 days after the full proposal has been transmitted to the committee members.

2. Oral Exam

The student is responsible for arranging the time and place of the oral exam. The Student will complete the digital Form A, as well as the digital Form "Qualifying Exam," before the exam meeting. Committee members should have the written proposal for approximately 7 days prior to conducting the exam. The exam chair conducts this meeting. The student will present 1 slide with key indicators (see



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instructions for semi-annual progress review meetings, above); 1 slide summarizing research progress in the last 6 months; 5 slides to summarize the proposal, bearing in mind that the committee has read the proposal in its entirety. This presentation should last between around 10 minutes. The presentation is followed by questions from the committee. These questions will be focused on the proposal, but may also include topics that are relevant to the student's coursework and other acquired knowledge. The student and committee should allocate a two-hour block for the exam.

To alleviate some of the stress associated with the PhD qualifying exam, students are strongly encouraged to keep a record of potentially interesting proposal topics as they are encountered throughout their first two years in the program.

### Judging the Qualifying Exam

1. Who:
  - a. The student's advisory committee judges the exam.
  - b. The senior member of the student's advisory committee (i.e. longest in the MMBIO department) who is not the advisor will conduct the exam.
2. Results: The committee may vote to "pass," "pass with qualification," "recess," or "fail".
  - a. It is possible to stop the exam at any point if two or more examiners vote to recess. This permits the candidate to reschedule the exam a second time. If the student does not pass the exam the second attempt, the student will be terminated from the program.
  - b. If two or more examiners vote to fail, the examination is failed and the graduate degree program of the student is terminated.
  - c. If the committee decides to "pass with qualification," then the qualification must be met by the student before they may submit the paperwork. Failure to meet qualifications within 1 month will be grounds to terminate the student from the program.

Reporting the Exam: The Qualifying Exam form, is digitally signed and submitted to the graduate secretary. A copy of the grant proposal, in its final form, will also be submitted.

### APPLICATION FOR GRADUATION

Graduation times are at the end of each semester or term: April, June, August, and December.

- **When to apply:** Usually before the beginning of the final semester of a student's program. Check the university deadlines
- **How:** Apply online through "myBYU"; click on "School"; click on "Apply for Graduation"
  - Make sure you have a current ecclesiastical endorsement for the semester you graduate and be enrolled in a minimum of 2.0 credits during the semester and 6.0 credits the year you wish to graduate
  - Click on "Progress Report" and make sure it is correct
  - Type in your name the way you would like it to appear on your diploma.
  - Inform the graduate secretary that you have submitted an application to graduate.

## WRITING THE DISSERTATION

Students can begin writing their dissertation/thesis as soon as their project has matured sufficiently and they have the approval of their advisor. Writing and continually revising along the way helps to clarify thinking and creates a better dissertation/thesis document.

Check the university requirements on the GRADPROG webpage under the resources tab <https://gradprogress.sim.byu.edu/resources>. Information includes requirements for format, style, preparing work for departmental approval, and preparing and submitting copies, forms, and fees to the library.

The final version of the dissertation should include the following:

1. Title page
2. Abstract page
3. Table of Contents
4. List of Tables
5. List of Figures
6. Thorough introduction, including background information from the published literature.
7. Research chapters\*
8. Summary/discussion of findings
9. Complete bibliography
10. Appendices. Unpublished data may also be included.

\*Ideally, a student's published work, including work in preparation for publication, will constitute the research chapters. These manuscripts will typically be inserted as double-spaced text, with figures and tables appropriately embedded.

## FINAL RESEARCH REVIEW MEETING

The final review of the student's research is held with the advisory committee (in conjunction with the final semi-annual progress review) to assure both the student and the committee that the body of research is satisfactorily completed, and the writing of the dissertation is underway. The student should present a final draft of the dissertation to his/her committee members soon after this meeting.

This meeting is held prior to scheduling the dissertation defense. The recommended time to schedule this review meeting is at the Final Progress Review, which would be in May for students graduating in August, or in November for students graduating in April.

As with all advisory committee meetings, it is the responsibility of the student to initiate and schedule this meeting.

## DISSERTATION DEFENSE

The dissertation defense is conducted when the student has written his/her dissertation and is prepared to defend it. Normally this is during the last semester the student is on campus. Before

The Dissertation Defense consists of two parts:

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1. The presentation of the dissertation
  - a. The BYU academic community is invited to listen and ask questions at the presentation.
2. The oral defense
  - a. Held immediately after the oral presentation, in a closed session.
  - b. The defense committee asks questions and votes on the student's performance.

### Judging the Defense

1. Who:
  - a. *The exam committee judges the exam. It is made up of the student's advisory committee.*
  - b. The senior member of the student's advisory committee (i.e. longest in the MMBIO department), who is not the advisor, will conduct the exam.
2. Results: The committee may vote to "pass," "pass with qualification," "recess," or "fail" the student.
  - a. If the decision is to "pass with qualification," the advisory committee may require minor revisions of the dissertation or strengthening of the candidate's preparation in subject matter areas. When these qualifications are cleared, and the committee has properly recorded the clearance with the Office of Graduate Studies, the student is judged to have passed the examination.
  - b. If two or more examiners vote to recess, the examination is stopped and postponed. This permits the candidate to reschedule (with the department and the Office of Graduate Studies) a second and final examination. The new examination cannot be held sooner than one month after the recessed examination. In addition, the second examination must be convened with the original committee. If the student does not pass an exam for a second time, the student will be terminated from the program.
  - c. If two or more examiners vote to fail, the examination is failed and the graduate degree program of the student is terminated.

The advisory committee will communicate the results of the defense to the graduate coordinator and graduate secretary. Depending on the results, the advisory committee will assist with any revisions that may be necessary.

**Scheduling the Defense:** The student is responsible to schedule the date, time, and place *at least two weeks in advance* of the defense. It is mandatory to meet with the graduate secretary to go over the details of the defense.

1. Check for university deadlines.
2. Get approval from your advisory committee. This includes completing and getting committee approvals the GRADPROG webpage under the "Ready for Defense" section.
3. Defend your dissertation.

The advisory committee will communicate the results of the defense to the graduate coordinator and graduate secretary. Depending on the results, the advisory committee will assist with any revisions that may be necessary.

### AFTER DEFENDING

- Once defense has been passed, make an electronic copy of your dissertation for the Library. This is referred to as an ETD. You can find out how to do this at <http://etd.byu.edu>. Please allow yourself a couple of days to complete this requirement. You submit your ETD online and then it must be approved by the department and the Dean's office before you do the next step.
- Check your ABC report for any "T" grades given for thesis or research courses. A diploma will not be granted unless these have been changed to passing grades. A change-of-grade form will be sent to you for this purpose when you schedule your defense.

# MS DEGREE REQUIREMENTS

## LENGTH OF TIME TO COMPLETE DEGREE

MS Degree: Two years (usual time); five years (university limit)

## CREDIT-HOURS

30 total credit-hours (5-8 research credit-hours and 6 thesis credit-hours)

## COURSE REQUIREMENTS

- BIO 503, Research Orientation, 1 credit, offered fall only
- MMBIO 661, Molecular Biology of the Cell, 3 credits, offered fall only
- MMBIO 663, Articulating Science, 2 credits, offered winter only
- MMBIO 665, Genomics 3 credits, offered winter only
- MMBIO 691R, Graduate Seminar, 2 credits (1 per semester), offered fall and winter  
(Attend every fall & winter semester, but only register for it two times for two total credit hours)
- MMBIO 692R Research in Progress, 2 credits (1 per semester), offered fall and winter  
(Attend every fall & winter semester, but only register for it two times for two total credit hours)
- MMBIO 695R, Research (5-8 credits)
- MMBIO 699R, Master's Thesis (6 credits)
- Graduate Elective courses, 3-6 credits, as approved by committee

## FORMATION OF ADVISORY COMMITTEE

The advisory committee advises, directs, and approves the graduate student's program, both the academic work and the research work. Each committee member, is involved in training and mentorship of assigned students. Careful evaluation, rigorous review of student research and instruction, and regularly scheduled meetings can ensure a quality experience. Students should feel free to meet with committee members individually or as a group as frequently as help and advice are needed. The student takes the initiative in the formation of the committee, and in scheduling semi-annual progress review meetings, which take place during the first half of November and during the first half of May.

The student is initially assigned to be advised by the MMBIO graduate coordinator, until the permanent advisory committee is established. The student must choose a permanent graduate advisory committee by the 1<sup>st</sup> progress report (November of the first year). Members comprising the advisory committee are selected by the student in consultation with the committee chair (the student's research advisor). The advisory committee is formally organized as approvals are recorded on the GRADPROG <https://gradprogress.sim.byu.edu/> webpage under the committee tab.

The MS advisory committee is comprised of at least three faculty members. The committee chair is the student's research advisor. Students may consider inviting one faculty member from a non-MMBIO department to participate on this advisory committee.

All members of the committee should be present at semi-annual progress review meetings, including the prospectus approval meeting held in May of the 1<sup>st</sup> year. If one member cannot attend, then the student can talk with that member individually to give updates and get signatures, if the advisor approves. However, for the coursework exam and thesis defense meeting, all

members must be present. For these two key exams, a committee member may attend remotely, via Zoom or some similar videoconferencing technology.

### PROGRAM OF STUDY

The Program of Study is a list of courses that meet both the program's requirements and the student's personal area of focus and interest. This list is determined by the student in consultation with the advisory committee. Most courses should be completed within the student's first year in the program.

The Program of Study and formation of the Committee can be completed under the Committee and Program of Study tabs on the GRADPROG webpage <https://gradprogress.sim.byu.edu/>. It is due immediately after the 1<sup>st</sup> progress review (November of the first year). If it becomes necessary during the course of a graduate program to alter the course plan or the composition of the advisory committee, these requests can be submitted to the GRADPROG webpage and they will then be approved by the members of the students committee.

Students desiring to take classes not on their Program of Study list need to get their advisor's approval before registering.

### SEMI-ANNUAL PROGRESS REVIEW MEETINGS

In November and May of each year (between the 1<sup>st</sup> and 15<sup>th</sup> of each month), graduate students meet with their advisory committee in a formal progress review meeting. Ideally, this meeting will last approximately 30 minutes. Other settings would be more appropriate for highly detailed discussions on research strategies. The student is responsible for scheduling the time and location of the meeting, and initiating appropriate digital Adobe Sign forms (including the standard progress review form). All digital forms are available upon request of the graduate secretary. The student's advisor conducts the meeting. The progress review meeting agenda is as follows:

- 10-minute PowerPoint presentation by the student, with minimal interruption from committee members (formatting for this presentation is detailed below)
- 10-minute discussion with committee
- 3-minute deliberation by committee, with the student outside the room
- 5-minute follow-up discussion with the student, where the verdict (satisfactory/marginal/unsatisfactory) is announced and the student is given further advisement about how to proceed in coming months.
- The student ensures forms are signed by committee members, approved by the graduate coordinator, and returned to the graduate secretary

Format for the 10-minute student presentation:

- **Key Indicators:** 1 slide entitled "Key indicators" detailing start date in the program, anticipated graduation date, courses completed, current and future courses, current GPA, and the following data for the past 6 months: hours/wk of research-related activities, percent attendance to RIP, percent attendance to seminars, TA responsibilities, and publications/presentations.

- **Context:** 1-2 slides to provide context and background information relevant to the research project.
- **Central Questions:** 1 slide entitled “Central Questions” setting forth the central question(s) addressed in the research project. After each question, list approaches being used to address the question. This should all fit on a single slide.
- **Results and troubleshooting:** 5-8 slides showcasing progress toward addressing the central questions, including barriers to progress and alternative approaches.
- **Plans:** 1 slide outlining research plans for the next six months.

Progress review meetings may serve multiple functions during the first two years:

- **The Program of Study** (see above) must be approved in progress review #1 (November of the first year)
- **The Prospectus** (see below) must be presented and approved in progress review #2 (May of the first year)
- **Coursework Exam** (see below) should be conducted upon completion of all or most of the required coursework, typically after the first two semesters have been completed. *Note, this meeting is conducted by the committee exam chair, which is the one who is longest in the MMBIO department who is not the student’s advisor.*

In every semi-annual progress review, a student’s progress is rated “Satisfactory,” “Marginal,” or “Unsatisfactory” by the committee. A satisfactory rating recommends continuation in the program. Marginal or unsatisfactory ratings require the committee to list the changes and requirements a student needs to meet within a specified period of time, to remedy the problem(s). Two consecutive marginal/unsatisfactory ratings result in termination of student’s program. When no evaluation is submitted, the university considers this “unsatisfactory.”

Examples of Marginal or Unsatisfactory Progress:

- Not completing requirements from a previous unsatisfactory/marginal evaluation
- Grade below 2.0 in any class
- Failed to pass Qualifying/Coursework Exam or Oral Defense
- Not spending sufficient time in the laboratory to accomplish research
- Not attending RIP meetings, seminars or graduate retreat
- Not progressing in the program, such as no results in experiments or no papers written
- Not being able to state any accomplishments since the last progress review
- Not submitting program of study, prospectus, etc. when it is due

If admitted provisionally, not completing the provisions

## PROSPECTUS

Plans for the prospectus should be formulated by the student in consultation with, and then approved by, the advisory committee. The prospectus is the student’s research proposal, and ideally, it becomes the outline of the student’s thesis.

A general format for the written prospectus would include

- Background information, significance, and project justification

- Clear statement of key questions and hypotheses being tested
- Experimental plan, including alternatives if planned approaches fail
- Expected results and timeline
- Bibliography

Generally, a MS prospectus will be 8 to 10 pages in length (single spaced with figures and tables, excluding the bibliography).

The prospectus approval meeting should be conducted as follows:

- The student is responsible for scheduling the time and place of the meeting, as for all progress review meetings.
- The student provides the written prospectus (electronically) to all committee members at least 7 days before the approval meeting.
- Committee members are expected to be familiar with the details of the prospectus prior to the meeting.
- The student will orally present with minimal interruption by committee members, using the following format: 1 slide summarizing key indicators (see instructions for semi-annual progress review meetings, above); 1 slide summarizing research progress in the last 6 months; 5 slides to summarize the prospectus, bearing in mind that the committee has read the prospectus in its entirety. This presentation should last between 5 and 10 minutes.
- Committee members will lead a 15-minute discussion focusing on strengths and weaknesses of the proposal.
- The student will be excused for deliberation.
- The student will be invited back to receive feedback from the committee relating to the progress review outcome (satisfactory/marginal/unsatisfactory) and approval of the prospectus. In many cases, the prospectus will be approved with qualifications, which may include significant revisions to the written document. Committee members will detail what these revisions are to accomplish, and how the qualifications will be approved.

Prospectus approval is formalized by the student uploading their prospectus to the GRADPROG webpage under the “Prospectus” tab and all approvals from the committee members are given. This digital form must be started previous to the progress review meeting along with the digital Form A. The deadline for the prospectus is progress review #2 (May of the 1<sup>st</sup> year) for MS students.

### COURSEWORK EXAM

The oral coursework exam (for MS students) tests the knowledge gained from the classes the student has taken. It should be taken when coursework is completed (or nearly completed), and no later than the second year of the program. It cannot be taken on the same day that the thesis defense is held. In preparation for the coursework exam, the student should provide committee members with a list of all courses completed or in progress. Prior to the exam, the student may consult with committee members about the kinds of questions they may anticipate, though committee members are expected to improvise questions during the exam. Students should expect that exam questions will mainly focus on fundamental biological processes, analytical thinking, and experimental design.



The student is responsible for scheduling the time and location for the exam. The student will start the digital Form A, as well as the digital form Coursework Exam prior start of the exam meeting. The exam chair (whoever is most senior in the MMBIO department who is not the student's advisor) conducts this meeting. The student will present 1 slide with key indicators (see instructions for semi-annual progress review meetings, above); 1 slide summarizing research progress in the last 6 months, and then the committee will conduct the exam. The student and committee should allocate a two-hour block for this meeting.

The committee may vote to "pass," "pass with qualification," "recess," or "fail" the student. It is possible to "stop" the exam at any point if two or more examiners vote to recess. This permits the candidate to reschedule the exam a second time. If the student does not pass the exam the second attempt, the student will be terminated from the program. If two or more examiners vote to fail, the examination is failed and the graduate degree program of the student is terminated. After the exam, committee members will approve or disapprove on GRADPROG.

### APPLICATION FOR GRADUATION

Graduation times are at the end of each semester or tem: April, June, August, and December.

- **When to apply:** Usually before the beginning of the final semester of a student's program. Check the university deadlines.
- **How:** Apply online through "myBYU"; click on "School"; click on "Apply for Graduation"
  - Make sure you have a current ecclesiastical endorsement for the semester you graduate and be enrolled in a minimum of 2.0 credits
  - Click on "Progress Report" and make sure it is correct
  - Type in your name the way you would like it to appear on your diploma.
  - Inform the graduate secretary that you have submitted an application to graduate.

### WRITING THE THESIS

Students can begin writing their thesis as soon as their project has matured sufficiently and they have the approval of their advisor. Writing and continually revising along the way helps to clarify thinking and creates a better dissertation/thesis document.

Check the university requirements on the GRADPROG webpage under the resources tab <https://gradprogress.sim.byu.edu/resources>. Information includes requirements for format, style, preparing work for departmental approval, and preparing and submitting copies, forms, and fees to the library.

The final version of the thesis should include the following:

1. Title page
2. Abstract page
3. Table of Contents
4. List of Tables
5. List of Figures
6. Thorough introduction, including background information from the published literature.
7. Research chapters\*

8. Summary/discussion of findings
9. Complete bibliography
10. Appendices. Unpublished data may also be included.

\*A student's published work, including work in preparation for publication, may constitute the research chapters. These manuscripts will typically be inserted as double-spaced text, with figures and tables appropriately embedded.

### FINAL RESEARCH REVIEW MEETING

The final review of the student's research is held with the advisory committee (in conjunction with the final semi-annual progress review) to assure both the student and the committee that the body of research is satisfactorily completed, and the writing of the thesis is underway. The student should present a final draft of the thesis to his/her committee members soon after this meeting.

This meeting is held prior to scheduling the thesis defense. The recommended time to schedule this review meeting is at the final progress review, which would be in May for most students.

As with all advisory committee meetings, it is the responsibility of the student to initiate and schedule it.

**Scheduling the Defense:** The student is responsible to schedule the date, time, and place *at least two weeks in advance* of the defense. It is mandatory to meet with the graduate secretary to go over the details of the defense.

4. Check for university deadlines.
5. Get approval from your advisory committee. This includes completing and getting committee approvals the GRADPROG webpage under the "Ready for Defense" section.
6. Defend your dissertation.

The advisory committee will communicate the results of the defense to the graduate coordinator and graduate secretary. Depending on the results, the advisory committee will assist with any revisions that may be necessary.

### AFTER DEFENDING

- Once defense has been passed, make an electronic copy of your thesis for the Library. This is referred to as an ETD. You can find out how to do this at <http://etd.byu.edu>. Please allow yourself a couple of days to complete this requirement. You submit your ETD online and then it must be approved by the department and the Dean's office before you do the next step.
- Check your ABC report for any "T" grades given for thesis or research courses. A diploma will not be granted unless these have been changed to passing grades. A change-of-grade form will be sent to you for this purpose when you schedule your defense.

## **CHANGE OF DEGREE LEVEL**

### **PROMOTION FROM MS PROGRAM TO PHD PROGRAM**

Occasionally, students in the master's (MS) program desire to expand their research into a more substantial body of work and obtain a PhD. The PhD degree requires a great deal more time and resource allocation by the student and the advisor, and more independent intellectual work on the part of the student. Therefore the MS student must formally apply to the graduate committee for such a change of status. To apply for a change in program, the MS student must submit the following documents to the graduate committee (via the graduate secretary):

- Current transcripts from undergraduate and graduate institutions
- GRE scores (scores that accompanied the MS application may be used)
- Copies of all semi-annual progress review forms from the MS program
- Detailed letter of intent written by the student, including:
  - Reasons(s) for wanting to switch to the PhD program
  - Status of current research, presented in a way that emphasizes the momentum of the project and the intellectual independence of the applicant
  - Explication of how the MS research project will be elevated/expanded to the level of research that constitutes a PhD dissertation, including anticipated publications or inventions
  - Anticipated date of completion of the PhD
  - Plans after earning the PhD
  - List of current committee members (all of whom should be asked to provide letters of recommendation by the graduate student), as well as one of the following two statements: "I waive my right of access to letters of recommendation" or "I do not waive my right of access to letters of recommendation." The former statement ensures candor on the part of the letter writers, and protects confidentiality.

After submission of these documents and receipt of letters from committee members, the MS student may be invited to interview with the graduate committee. After careful consideration, the graduate committee will then respond with a formal letter to the applicant indicating either acceptance or denial of the request to change programs. In some cases, a conditional acceptance may be granted, with conditions clearly delineated.

Applications to change programs may be submitted to the graduate committee at any time during the year, but submission in January or February allows the student to be considered alongside outside applicants.

### **APPROVAL OF AN UPDATED PROSPECTUS**

Students newly promoted into the PhD program must update their prospectus to reflect the increased scope of the PhD work. This new prospectus needs to be approved by the committee, with approvals through GRADPROG. The updated prospectus should be approved within 6 months of the promotion.

## QUALIFYING EXAM TIMELINE FOR PROMOTED STUDENTS

Students transitioning from the MS program to the PhD program have one year from the date of transition to complete the qualifying exam.

## **PARTICIPATION IN THE MMBIO COMMUNITY**

### GRADUATE STUDENTS ARE EXPECTED TO ATTEND THE FOLLOWING:

- MMBIO seminars held during the fall & winter semesters
- Graduate Research in Progress (RIP) Meetings held during the fall & winter semesters
- Graduate Retreat held at the conclusion of each summer

#### Seminars

During the regular academic year, seminars will be held on a weekly basis. In these seminars, scholars from BYU as well as invited guests from other institutions, present cutting-edge research findings. Graduate students will use these seminars as an opportunity to get up to date in various fields and to learn the art of scientific communication. Opportunities also exist for students to participate in hosting seminar speakers – consult your advisor for more information.

#### Graduate Research in Progress (RIP) Meetings

RIP meetings are held regularly during fall and winter semesters. They provide graduate students with an opportunity to practice effective scientific communication and receive feedback on their research work from MMBIO faculty and graduate students. Each graduate student can expect to give RIP presentations once or twice per year, but is required to attend every meeting. RIP presentations are typically 15-20 minutes in length. The presentation style should emphasize clarity and encourage active participation from the audience.

#### Graduate Retreat

A graduate retreat is held annually (just prior to the start of fall semester) to allow each student to present research findings. Presentations are directed to the graduate faculty and to other graduate students and interested individuals. The retreat normally lasts a full day and **attendance is mandatory**.

### Optional Clubs:

#### Life Sciences Graduate Student Club

We are a club for graduate students by graduate students! Our goals are to supplement existing graduate programs with activities that encourage career networking/job skills, inter-departmental collaborations, and that increase graduate student social opportunities. Meetings are held monthly and include career panels (talk to the experts!), resume/LinkedIn tutorials, mental health advice, and science writing journal clubs.

If you would like to be involved in planning, brainstorming, or sharing activities, (or if you have a really sweet idea!) please contact the club president at [LSGSclub@gmail.com](mailto:LSGSclub@gmail.com).

### BYU graduate student society:

The BYU graduate student society (BYUSS) strives to **enrich, enhance,** and **encourage** your graduate school experience by providing opportunities for intellectual growth, professional development, spirituality, and social interaction. Find out more at <http://gss.byu.edu/>.

## SUPPLEMENTAL INFORMATION

### SOME PEOPLE YOU'LL WANT TO KNOW

- Dr. Joel Griffiths, Department Chair, Office 4007 LSB
- Dr. Steven Johnson, Graduate Coordinator, Office 3132 LSB
- Teri Moser, Business Manager, Office 4010 LSB (Funding)
- Kevin Johnson, Graduate Secretary, 4012 LSB (Academic Advisor)

### MMBIO DEPARTMENT OFFICES

- 4007 LSB, Department Secretary, 422-7403
- 4007 LSB, Student Secretaries, 422-2889
- 4014 LSB, College Conference Room
- 4012 LSB, Advisor & Graduate Secretary, 422-4293,  
[mmbio@byu.edu](mailto:mmbio@byu.edu), See *MMBIO Advisor for grad questions and forms*

### GETTING A BYU-ID CARD

- ID Center, 2310-WSC (Wilkinson Student Center)
- Used to check out books in the library, pay for copies, take tests at the Testing Center, or as a “Signature Card” (debit card on campus), as well as for lab/building access.

### DEPARTMENT MAILBOX

- Located in 4007 LSB
- Graduate student mail will be placed in your advisory committee chairs mailbox in 4007 LSB

### KEYS AND CODES

- *Codes:* For access to the copy machine, contact your advisory committee chair for research purposes. For department printing contact the student secretaries in 4007 LSB. For access to a lab, contact the faculty member responsible for that lab.
- *After-hours access to LSB:* obtain authorization from your advisory committee chair. The Life Science Building is accessed with a student’s BYU-ID card, not a key.

### ROTATIONS

Rotations allow students to spend a period of time in two or more faculty labs during the first few months of the program, giving them broader exposure to faculty research interests as well

as getting to know faculty members prior to joining a lab. Which lab to rotate in, and the duration of the lab experience, is flexible. Lab rotations can be made with any eligible faculty of choice, if space is available. Students should take the initiative in asking faculty members for rotation experiences as well as determining their length. Students can receive credit for MMBIO-695R for this research experience. MS students not already committed to a lab are given the option to do rotations during the first semester of their program (two rotations are typical). PhD students who are financially supported by the department are strongly encouraged to do rotations during the first two semesters of their program (three rotations are typical). After rotations are completed, a mutual decision between student and faculty is reached regarding the choice of advisor.

### COLLEGE AND DEPARTMENT FACILITIES

- 3057 LSB – In the **Confocal Microscopy Lab** a researcher can capture high-resolution fluorescence data from cells and tissues. The laboratory also provides resources for histological sectioning. Additionally, small aliquots of secondary antibodies may be purchased at low cost. For more information go to <http://confocal.byu.edu>.
- 2142 LSB – The **Computer Center**. Open access during the hours that the building is open. Contains about 24 computers, a printer and a scanner. Fee charged for scanner use and for copies printed. (Your Signature Card is used to pay for these items.)
- 3118 LSB – The **Research Instrumentation Core Facility** (aka RIC) houses specialized equipment for use by researchers at BYU. It is equipped with three flow cytometers, Cytospin centrifuge, Sorvall centrifuge, fluorescent plate reader, fluorescence microscope with digital imaging, and Nanodrop spectrophotometer. The RIC also provides access to a new state-of-the-art cell sorter housed in the Benson Building. Dr. Sandra Hope is the Director of the Lab. For further information please visit the website at <http://ricfacility.byu.edu>.
- 4046 LSB – The **DNA Sequencing Center**. Equipment includes the Applied Biosciences 3730xl DNA analyzer for BigDye Sanger sequencing, and the Illumina HiSeq 2500 for deep sequencing applications. The center will soon be acquiring a PacBio Sequel single-molecule, long-read, high throughput sequencing instrument. <http://dnasc.byu.edu/indexResources.asp>

### **ENROLLMENT AND REGISTRATION REQUIREMENTS**

*For additional information see the current BYU Graduate Catalog*

#### REGISTRATION

Students register for courses using the website my online at <https://mymap.byu.edu>

#### FULL TIME STATUS

For graduate students, full time enrollment is 9 credit hours for a semester and 4.5 credit hours for a term.

ADV form 2a lists qualifications to petition for full-time status when you are enrolled in less than 9 (or 4.5 credits in a term) credits, if this status is needed (i.e. loan requirements).

### CONTINUOUS ENROLLMENT

The department expects graduate students to be continuously enrolled until all program requirements are completed.

- ***New students:*** must enroll for at least 2 credits in first semester or term of their graduate program.
- ***Everyone:***
  - Enroll a minimum of 6 credits per academic year
    - If admitted winter, 4 credits for academic year
    - If admitted spring or summer, 2 credits for academic year
  - Receive acceptable grades (no E's, E's, D's, W's, UW's or I's)
  - Satisfactory semi-annual progress reports
- ***PhD candidates:*** In addition to the above requirements, PhD candidates must fulfill a residency requirement by registering for at least register two consecutive 6-credit semesters on BYU campus during their program.
- ***International students:*** Immigration law requires minimum enrollment of 9 credits each fall and 9 credits each winter, until all class work is completed. Then minimum enrollment is 2 credits each fall and each winter semesters. Immigration does not require Spring & Summer enrollment; however, you must still have the minimum of 6 credits per year to fulfill the university requirement.

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### GRADUATE STUDENT WORK ELIGIBILITY GUIDELINES

*If you are hired as a TA or paid a research stipend, you must meet these guidelines in addition to the Graduate Studies guidelines on Continuous Enrollment.*

#### **Fall & Winter Semesters:**

##### U.S. Citizens:

- Must register for at least 2 credit hours each Fall semester and each Winter semester.

##### International Students:

- Must register for at least 9 credit hours each Fall semester and each Winter semester. See ADV form 2a for exceptions once course work is completed.

#### **Spring & Summer Terms:**

##### U.S. Citizens:

- Must register for at least 1 credit hour in *either* Spring term or Summer term.

##### International Students:

- Must register for at least 4.5 credit hours (day-continuing) in *both* Spring term and Summer term unless you are on official break. If you are on official break, you don't need to register for any classes to maintain work eligibility during Spring and Summer terms. See ADV form 2a for exceptions once course work is completed.

### LOSS OF CONTINUING STATUS

If continuous status is lost, you will need to:

- Fill out an “Application to Resume Graduate Study” form GS6 and pay a non-refundable \$600.00 fee.
- Submit a “Reapplication Honor Code Commitment & Ecclesiastical Endorsement” form GS6a.
- If international, submit new financial certification forms, GS form I-1 and I-2.
- Register for at least 2 credits for the term in which you are readmitted.

Note that students who are not approved for readmission through the process above, can apply to the same graduate program through the regular online submission process, but no previous course work will be considered on the new program of study.

### LAST SEMESTER

- Two hour minimum registration is required for all graduate students during the semester or term in which the student defends their thesis/dissertation and finishes the graduate program. If a student is finishing in August, they may register for 2 hours in Spring term, 2 hours in Summer term, or 1 hour in each Spring & Summer term. Every student must have minimum six credits the year they graduate
- Students must have current ecclesiastical endorsement for the semester/term in which they apply for graduation and receive their diploma.

### GRADUATION DATES

BYU students can graduate in April, June, August, and December of each year. However, convocation and commencement will only be held in conjunction with April and August graduations. Those graduating in June or December may attend convocation and commencement with those graduating immediately prior or after their graduation.

## **FINANCIAL ASSISTANCE**

### PHD STUDENTS:

PhD Students receive a stipend and full tuition coverage on their program classes. To receive continued departmental funding, these students must:

1. Be a degree-seeking, continuously-enrolled PhD graduate student
2. Have & maintain a 3.0 GPA (cumulative program GPA)
3. Maintain satisfactory progress towards their degree
4. Choose appropriate lab (Note that the department cannot fund more than one PhD student per lab, and PhD projects can be expensive for supplies as well. Therefore, if a student wishes to join a lab, the faculty member must have funding to support the student)

Stipend: The stipend consists of one semester as a teaching assistant (TA) for the department and two semesters as a research assistant (RA) and is paid as a contract each semester. The department secretary will set up the contract and send it to the student to be electronically signed each semester. Students should be registered for a minimum 2 hours of credit each fall and each winter semester and need a total of 6.0 credits per academic year to keep graduate student status (August to August).

Tuition Scholarship: If a tuition scholarship is awarded, it is only for those classes required for a degree (on the student’s program of study list). If a student desires to take a course for



personal interest, he/she will need to pay for it. However, if a student is enrolled full-time (8.5 credits per semester or 4.5 credits per term) they may elect to add a class of their choice, since there will be no added tuition costs to the department.

All graduate students may attend religion courses without cost or credit by completing the “Graduate Student Request for No-Cost/No-Credit Religion Course” form found on the Grad Studies Web site.

#### MASTERS STUDENTS:

Masters students are not guaranteed financial assistance, but should consider opportunities to TA, access temporary departmental assistance, or access assistance from external funding that may be available through the advisory committee chair.

#### LENGTH OF TIME FOR DEPARTMENTAL SUPPORT

The maximum length of time a student may receive financial support from the department is 6 years (18 semesters) for PhD students. Support is always contingent upon receiving satisfactory status and a 3.0 GPA. Students changing from masters to PhD students need to consult with the department on the length of time for departmental support.

#### NON-DEPARTMENT FINANCIAL AID

BYU Financial Aid Office offers loans, including short term and Stafford Loans. BYU Graduate Studies Office offers research fellowship awards and mentoring grants. Some of the scholarships listed on Prestigious Scholarships website are also available for graduate students. You may also check with faculty members for other externally funded projects.

Stafford loans will require students to start paying back loans, if registered for less than half time (4.5 credits in a semester). Other loans may have required enrollment qualifications. The financial office can tell if you qualify for exceptions, in which case you can petition for full-time status.

#### STUDENT OUTSIDE EMPLOYMENT

Outside employment is discouraged. Maximum time and resources should be used for student progress toward a degree. However, if it is necessary, a short memo from the student with endorsement by his/her advisor should be submitted for approval to the Graduate Coordinator. It should also be noted that BYU Policy does not allow a student to work for more than one church employer at a time (examples of other church employers include Deseret Book, Church Offices, other church schools etc.)

#### **OTHER POLICIES**

##### HEALTH INSURANCE

BYU requires all full time graduate students to be insured. If you have private insurance, please provide that information to BYU through Route Y. BYU offers an annual insurance policy through the Student Health Program. Current premium rates can be found at: <http://health.byu.edu>. **BYU insurance DOES NOT MEET ACA REQUIREMENTS**, students should understand insurance needs and requirements before choosing a health plan.

## INTERNATIONAL STUDENTS

An international graduate student is required to enroll in at least 9 semester hours of credit each fall and each winter semester. Once all course work is complete, the student should request a memo from the MMBIO Advisor to the International Office which certifies that all course work is complete. The student is then required to enroll for only thesis (699R) or dissertation (799R) credit, which may be as few as two credits per semester.

The International Office (as required by Immigration and Naturalization rules) does not require spring and/or summer enrollment. However, international students must still comply with university requirements of registering for at least 6 credit-hours per academic year (fall semester through summer term).

International students can only work a maximum of 20 hours per week during the fall and winter semesters. See the International Office regarding any other limitations or restrictions.

An international student should keep in contact with the International Services Office for the varying requirements of the Immigration and Naturalization Office and their respective countries. The International Services Office is at 1351 WSC, phone number 422-2695, email at [intloff@byu.edu](mailto:intloff@byu.edu), and website at [www.international.byu.edu](http://www.international.byu.edu).

## MATERNITY LEAVE

It is the student's responsibility to coordinate their maternity leave with their PI and the graduate coordinator, including any necessary paperwork if the student intends an extended leave.

## INTERRUPTION OR TERMINATION OF PROGRAM

Students must get approval from the department chair and graduate coordinator before they interrupt their graduate program. The length of time from the start of graduate study, the interrupted time, and the completion of the degree must be within the university's degree time limits, which are 5 years for M.S. programs and 8 years for PhD programs.

A student may then resume study with:

- Approval of the department and graduate dean
- Submission of form 1a, Application to Resume Graduate Study
- A \$125.00 non-refundable processing fee
- Reapplication of Honor Code Commitment form
- New Financial Certification form (for International students)

A student who wishes to terminate or withdraw, should contact their advisor first and then the Discontinuance Office, B-150 ASB.

Once enrolled, a graduate student loses eligibility to register if:

1. The student has not fulfilled the minimum registration requirement (6 hours per academic year).

2. The student has not submitted a program of study as required: master's students by the third week of the second semester after admission; doctoral students by the third week of the beginning of the second year.
3. Graduate Studies has not received official transcripts showing that the required prerequisite degrees have been conferred.
4. The student's time limit has expired.
5. The student has received two unacceptable evaluations in succession.
6. The student has withdrawn or has been terminated by the department.
7. The student has violated the BYU Honor Code and is not cleared by the Honor Code Office.
8. The student has failed to submit an annual continuing ecclesiastical endorsement.
9. The student has graduated from the graduate program.

Termination of graduate status may result if a student:

1. Fails to satisfactorily complete the conditions of acceptance.
2. Fails to fulfill the university's minimum registration requirements.
3. Makes a request to withdraw (with the intent to pursue a degree at another university, for personal reasons, or in response to department recommendation).
4. Receives two consecutive marginal and/or unsatisfactory rating in a semi-annual progress review and/or is unable or unwilling to comply with conditions placed upon him/her.
5. Fails to make satisfactory progress toward a graduate degree, as deemed by the department or university.
6. Fails the departmental qualifying exam including grant proposal requirements (for a PhD degree student) or coursework oral exam (for Master's degree students)
7. Fails the Thesis Defense or Dissertation Defense.
8. Violates the university's standards of conduct or Honor Code.
9. Exceeds the time limit (5 years for master's, 8 years for doctoral).

A student may request a review of termination by contacting the department chair in writing. A student who has made significant progress on a PhD degree but is terminated from that program, can petition to convert to a master's program. A student who wishes further consideration may request review by the college dean. A final request for review may be made to the university graduate dean.

### UNIVERSITY POLICIES

Brigham Young University desires to provide personnel and students with a work and academic environment free from discrimination, including any form of unlawful sexual harassment or inappropriate gender-based behavior. If you encounter sexual harassment or gender-based discrimination, please talk to your advisor, contact the Equal Opportunity Office at 422-5895, or contact the Honor Code Office at 422-2847.

Students are expected to uphold the honor code commitment while attending the Brigham Young University. This includes honesty; obeying the laws and campus policy; living a chaste and virtuous life; respecting others, abstaining from alcohol, tobacco, coffee, and abusive

substances; and encouraging others. The Honor Code is online at [http://honorcode.byu.edu/The\\_Honor\\_Code.htm](http://honorcode.byu.edu/The_Honor_Code.htm).

BYU is committed to providing reasonable accommodation to qualified persons with disabilities. If you have any disability that may adversely affect your success, please contact the University Accessibility Center at 422-2767. Services deemed appropriate will be coordinated with the department.

Plagiarism of any kind is completely contrary to the established practices of higher education, where all members of the university are expected to acknowledge the original intellectual work of others that is included in one's own work. Intentional plagiarism is a form of intellectual theft that violates widely recognized principles of academic integrity as well as the Honor Code. Such plagiarism may subject the student to appropriate disciplinary action administered through the university Honor Code Office, in addition to academic sanctions that may be applied by the department. Inadvertent plagiarism, whereas not in violation of the Honor Code, is nevertheless a form of intellectual carelessness that is unacceptable in the academic community.

Brigham Young University, is an educational institution affiliated with The Church of Jesus Christ of Latter-day Saints. Within this context of religious preference, Brigham Young University considers equal opportunity and nondiscrimination to be fundamental to its mission, goals, and objectives.

## LIST OF FORMS

Forms A, B, C, and D can be obtained digitally from the graduate secretary.

All other forms can also be found online at the Graduate Studies web page, [www.byu.edu/gradstudies](http://www.byu.edu/gradstudies), and click on “Forms & Resources” tab.

Form	What is it used for	When to use it	Where to find it
ADV 6: No cost religion class	To audit a religion class and not have to pay	Whenever you want to take the religion class	<a href="http://www.byu.edu/gradstudies">www.byu.edu/gradstudies</a>
ADV 3: Program of Study	Listing of approved: 1) program courses & 2) committee members	PhD-Progress Review#2 MS – Progress Review #1.	<a href="http://www.byu.edu/gradstudies">www.byu.edu/gradstudies</a>
ADV 3b: Program of Study change	To change: 1) courses or 2) committee members	As needed	<a href="http://www.byu.edu/gradstudies">www.byu.edu/gradstudies</a>
ADV 8 & ADV8a: graduation deadlines	Make sure you meet university deadlines	When you start planning to graduate	<a href="http://www.byu.edu/gradstudies">www.byu.edu/gradstudies</a>
ADV 8a: Graduation Requirements	Directions to apply for graduation	Before you apply online to graduate	<a href="http://www.byu.edu/gradstudies">www.byu.edu/gradstudies</a>
ADV 8c: Schedule of Final Oral Exam	Date, place & title for dissertation/thesis defense	At least 2 weeks prior to dissertation/thesis defense	<a href="http://www.byu.edu/gradstudies">www.byu.edu/gradstudies</a>
ADV 8d: Approval of Dissertation/Thesis	Confirming passing of dissertation/thesis	At the defense	<a href="http://www.byu.edu/gradstudies">www.byu.edu/gradstudies</a>
ADV 9 – Member Evaluation of Final Exam (Masters)	Individual committee members evaluate your defense	At the defense	Sent to you by gradstudies after you schedule your defense
ADV 9doc: Member Evaluation of Exam (PhD)	Individual committee members evaluate your defense	At the dissertation defense	Sent to you by gradstudies after you schedule your defense
ADV 10: Report of Committee Action on Final Exam	Graduate Committee’s evaluation of thesis or dissertation defense	At the dissertation or thesis defense	Sent to you by gradstudies after you schedule your defense
ADV 11: Standards for Dissertation or Thesis	Format and paper requirements for dissertation/thesis	Before you begin writing your thesis or dissertation	<a href="http://www.byu.edu/gradstudies">www.byu.edu/gradstudies</a>
ADV 11a, b, d: Templates & examples	Template for writing dissertation/thesis	Before you begin writing your thesis or dissertation	<a href="http://www.byu.edu/gradstudies">www.byu.edu/gradstudies</a>
ADV 12a (thesis) & ADV 12b (dissertation)	Checklist for submitting dissertation/thesis and graduating	Last semester, when you start planning to graduate	<a href="http://www.byu.edu/gradstudies">www.byu.edu/gradstudies</a>
<i>Form A: Graduate Progress Review</i>	<i>Confirm committee reviews held</i>	<i>November and May</i>	<i>Grad Secretary, 4012 LSB</i>
<i>Form B: Prospectus Document</i>	<i>Committee approves your Prospectus</i>	<i>PhD-3<sup>rd</sup> Progress Review Master’s- 2<sup>nd</sup> Prog.Review</i>	<i>Grad Secretary, 4012 LSB</i>
<i>Form C: Coursework Exam</i>	<i>Committee rules on coursework exam</i>	<i>Master’s – 4<sup>th</sup> Progress Review</i>	<i>Grad Secretary, 4012 LSB</i>
<i>Form D: Qualifying Exam</i>	<i>Committee rules on comprehensive exam</i>	<i>PhD – 4<sup>th</sup> Progress Review</i>	<i>Grad Secretary, 4012 LSB</i>

## GRADUATE COURSES LIST

MMBIO Course	Title	Cr. Hrs.	Offered	Description
510	History and Philosophy of Microbiology & Molecular Biol.	2	Winter Even Yrs	Exploring the historical and philosophical context of great discoveries in microbiology and molecular biology through readings, group discussion, and analytical writing.
512	Gene Regulation	2	Winter Odd Yrs	Explore how cells respond to developmental, physiological, and environmental stimuli through molecular mechanisms that modulate DNA structure, DNA transcription, RNA translation, and macromolecular degradation.
514	Advanced Immunology	2	Fall Even Yrs	Exploration of current topics in immunology through critical reading of primary literature, presentations, group discussions, and analytical writing about specific areas within the discipline.
516	Bacteria-Host Interactions	2	Winter Even Yrs	Exploration of bacterial and host functions that facilitate colonization in pathogenic and symbiotic systems.
518	Select Pathogens	2	Fall Odd Yrs	Current literature dealing with special pathogens
520	Molecular Virology	2	Winter Odd Yrs	Molecular mechanisms of virus architecture, attachment, and entry pathways, replication strategies, oncogenesis, and mechanisms of pathogenesis.
522	Flow Cytometry	2	Fall	Explore the theory and instrumentation of flow cytometry, including current applications and hands-on training.
528	Current Trends in Pathogenesis	1	Fall, Winter	Trends from current literature on pathogenesis of infectious diseases.
551R	Current Topics in MMBIO	1-3	On demand	Readings from current literature on a specific topic; student presentations and discussions.
661	Molecular Genetics in Practice	3	Fall	Fundamental concepts in molecular cell biology with an emphasis on model organisms and experimental approaches including plasmid-based tools, gene manipulation, protein analysis, microscopy and genomics.
663	Articulating Science	1	Winter	Students will practice identifying open scientific questions and describing context, impact, and detailed experimental research plans.
665	Genomics	3	Winter	
691R	Graduate Seminar	1	Fall Winter	Presentations by selected speakers from the College, Department, and outside of the university
692R	Research in Progress	1	Fall Winter	Graduate student research presentations. Weekly meetings highlighting current progress and discussion-based feedback from faculty and student peers.
695R	Research	1-18	F,W,Sp,Su	
699R	Master's Thesis	1-9	F,W,Sp,Su	
799R	PhD Dissertation	1-9	F,W,Sp,Su	

## GRADUATE FACULTY LIST

Faculty	Phone 801-422-	Room LSB	PhD Date and Institution	Research Specialty
Brad Berges	8112	3136	2005 U of Pennsylvania	Humanized mouse models, bacterial pathogenesis
Donald P. Breakwell	2378	2135	1992 Purdue U.	Soil microbiology; microbiology education
Mary Davis	6207	3129	2013 Vanderbilt University	Genetic analysis, records-based medical research
David Erickson	1981	3133	2003 U of Calgary	Bacterial pathogenesis
R. Paul Evans	3259	3139	1983 Medical College of Virginia	Molecular biology
Joel Griffitts	7997	3131	2004 U. of California at San Diego	Plant-microbe interactions, antibiotic synthesis
Julianne Grose	4940	3140	2003 U. of Utah	Yeast carbon metabolism
Sandra Hope	1310	3134	2000 U of Kentucky	Immunology, bacteriophage biology
Steven Johnson	9170	3132	2004 Yale University	Nucleosomes, chromatin, and epigenetics
William R. McCleary	6215	3128	1990 U.C. Berkeley	Bacterial signal transduction
Brent Nielsen	1102	3130	1985 Oregon State U	Plant organelle molecular biology
Kim L. O'Neill	2449	3142	1986 New University of Ulster, N. Ireland	Oncology, immunology
Brett E. Pickett	2506	3141	2010 U of Alabama at Birmingham	comparative genomics & infection/cancer
Brian Poole	8092	3138	2004 Pennsylvania State U.	Cell-virus interactions
Richard A. Robison	2416	4007B	1988 B.Y.U.	Bacterial pathogenesis, host immune responses
Scott Weber	6259	3137	2005 U of Illinois	T cell immunology
Eric Wilson	4138	3135	2000 Montana State University	Immunology

It is the student's responsibility to monitor the deadlines and to know the requirements of the ETD process. Deadlines can be found on the GRADPROG webpage under the Resources tab <https://gradprogress.sim.byu.edu/resources>.

## MASTER'S DEGREE STUDENT REQUIREMENTS

- Semi-annual student progress reviews are every November & May until graduation
- Request digital forms from Graduate Secretary

### 1ST PROGRESS REVIEW (NOV)

- Progress Review 1
- Program of Study & Exam Advisory Committee

### 2ND PROGRESS REVIEW (MAY)

- Progress Review 2
- Prospectus

### 3RD PROGRESS REVIEW (NOV)

- Progress Review 3

### 4TH PROGRESS REVIEW (MAY)

- Progress Review 4
- Coursework Exam, may vary

### SUBSEQUENT PROGRESS REVIEWS UNTIL GRADUATION

- Progress Reviews EVERY May & November

## THESIS & GRADUATION REQUIREMENTS

- Apply for Graduation
- Schedule Thesis Defense  
(Schedule at least 2 weeks before you want to hold it.)
- Hold Thesis Defense
- Submit Thesis on ETD site

- Students must take 6.0 credits per academic year (August - August).
- Students must be enrolled in 2.0 credits the semester they graduate.



## PHD DEGREE STUDENT REQUIREMENTS

- Semi-annual student progress reviews are every November & May until graduation
- Request digital forms from Graduate Secretary

### 1ST PROGRESS REVIEW (NOV)

- Progress Review 1

### 2ND PROGRESS REVIEW (MAY)

- Progress Review 2
- Program of Study & Exam Advisory Committee

### 3RD PROGRESS REVIEW (NOV)

- Progress Review 2
- Prospectus

### 4TH PROGRESS REVIEW (MAY)

- Progress Review 4
- Qualifying Exam

### SUBSEQUENT PROGRESS REVIEWS UNTIL GRADUATION

- Progress Reviews EVERY May & November

## DISSERTATION & GRADUATION REQUIREMENTS

- Apply for Graduation
- Schedule Dissertation Defense  
(Schedule at least 2 weeks before you want to hold it.)
- Hold Dissertation Defense
- Submit Dissertation on ETD site

- Students must take 6.0 credits per academic year (August - August).
- Students must be enrolled in 2.0 credits the semester they graduate.