University of Maine
Graduate School of Biomedical Science and Engineering
Faculty & Ph.D. Student Handbook
Last updated: July 2022

Disclaimer - the handbook is in draft form and will be reviewed by the GSBSE Mgmt. Team in Aug 2022.

1. OVERVIEW

Established in 2006, the Graduate School of Biomedical Science and Engineering (GSBSE) is a cooperative program between with the University of Maine (UMaine), the Jackson Laboratory (JAX), Maine Medical Center Research Institute (MMCRI), Mount Desert Island Biological Laboratory (MDIBL), University of New England (UNE). Building from the foundations of the UMaine Cooperative Ph.D. Program in Molecular Genetics and Cell Biology and a National Science Foundation Integrative Graduate Education and Research Traineeship (IGERT) in Functional Genomics, the GSBSE was formed in order to foster collaborative research among the consortium partners, to train students within the state of Maine for interdisciplinary research, and provide doctoral-level education in the biomedical sciences, including genomics, biophysics, bioengineering and nanotechnology, molecular and cell biology, neuroscience, toxicology, and the molecular mechanisms of disease.

UMaine serves as the administering unit of the GSBSE and is the degree granting institution of the consortium. Base funding for the GSBSE is permanently allocated from the University's Maine Economics Improvement Fund (MEIF). The students in the GSBSE Ph.D. program are University of Maine graduate students and will receive a Doctor of Philosophy in Biomedical Science or a Doctor of Philosophy in Biomedical Engineering.

***Please note**: The requirements outlined in this document pertain to all GSBSE Ph. D. students and faculty. Although there may be guidelines or requirements specific to individual partner institutions, this document lists the minimum requirements for GSBSE. The requirements of the partner institutions must also be considered and honored when the student is carrying out her/his dissertation work at a partner institution.*

1.1 Administration

The GSBSE is led by a Director or Program Director, who is supported by a staff administrator. The Director or Program Director must be a tenured faculty member of UMaine and receives guidance and advice from a Steering Committee comprising a representative from each participating institution, along with a representative of the UMaine Graduate School. Additionally, the Director or Program Director reports to the Dean of the Graduate School. In addition, an External Advisory Board with representation from the medical profession, academia and industry serves to provide counsel and perspective regarding scientific direction and curricula, assists in identifying and securing external funding, aids in networking for students and faculty, and serves an advocacy role both internal and external to the University. The GSBSE exists as an organizational unit within the Office of Research and the Graduate School at UMaine.

2. ADMISSION

All incoming graduate students should be familiar with the guidelines and regulations of the University of Maine Graduate School
(https://umaine.edu/graduate/about/guidelines-and-regulations/).

Applicants are admitted into the GSBSE Ph.D. programs by the UMaine Graduate School in accordance with the policies and regulations as defined by the Executive Committee of the Graduate Board under the recommendation of the Admissions Committee of the GSBSE (see 2.2 The Admissions Committee and Review Process).

A strong applicant will have an undergraduate degree in the sciences, engineering, or related discipline, with an outstanding academic record. Evaluation for admission will also consider the motivation and career goals of the applicant, in addition to research experience and the strength of recommendations. The application packet should include:

- University of Maine Graduate School application
- Letter of interest, including motivation to pursue an advanced degree
- English language proficiency test scores, if appropriate
- Three letters of recommendation from professional or academic references
- Official academic transcripts (unofficial transcripts accepted for review)
- Any other relevant information that will aid in the evaluation of the applicant

Applications are accepted until December 1st of the year prior to matriculation and are only accepted for the Fall semester. The application review process starts in December. The Admissions Committee completes an initial review of all applicants to select candidates for initial interviews for domestic and international students. Finalists selected from the initial interviews are invited for on-site or video conference interviews. Notification of admission into the program occurs in the Spring.

2.1 Employees Of Partner Institutions Becoming GSBSE Students

If an employee of a GSBSE partner institution is admitted to a GSBSE degree program, to avoid conflicts of interest, the student must select an academic advisor who is not his/her work supervisor, and the dissertation research must not overlap with his/her employment work duties.

2.2 The Admissions Committee and Review Process

The Admissions Committee is made up of at minimum one graduate faculty member from each of the partner institutions and a Committee Chair supported by the staff administrator. There should be at minimum one faculty member representing the biomedical science program and one faculty member representing the biomedical engineering program. All committee members are nominated by the Steering Committee and the Director or Program Director serves on the Committee as a non-voting, ex officio member.

The Admissions Committee is tasked with reviewing all completed applications to the GSBSE Ph.D. programs received before the application deadline for admissibility based on factors such as academic performance, potential for contributing, and commitment to educational success. After reaching a consensus, the Committee Chair will then recommend applicants to the GSBSE administration to receive offers of admission. The GSBSE Director or Program Director will then communicate an offer of admission to the applicant via email.

All attempts should be made to complete the admissions process in a timely manner. Participation on the Admissions Committee will require sustained time and effort. Unless otherwise organized, the Committee will meet from Noon to 1:00pm Eastern Time on the 1st and 3rd Fridays of each month from the month prior to the application deadline until a consensus has been reached on all eligible applications. In addition, the Admissions Committee members should seek to be available for virtual and in-person interviews as scheduled.

2.3 Admission Tracks and Direct Admission

There are multiple Admissions Tracks into the GSBSE Ph.D. programs that are differentiated by initial funding source and rotation requirements. Applicants to the GSBSE Ph.D. programs will be asked to indicate the Admissions Track to which they are applying in the UMaine Graduate School Application and may not apply to more than one Admissions track in a single application cycle. The Admissions Committee can field requests for and approve or recommend transfers between Admissions Tracks.

All applicants regardless of the admissions track are subject to review by the Admissions Committee prior to acceptance. Partner sites may choose to implement additional and/or concurrent admissions review processes for applicants applying to their track. All attempts should be made by the Admissions Committee and the partner sites to align admissions processes.

The Open Rotations Admission Track is the GSBSE department-supported program with laboratory rotations (see 5.1 Laboratory Rotations). The number of available positions in the GSBSE supported cohort is dependent on available funding through the GSBSE MEIF account. All attempts should be made by the administration to maximize the number of available positions.

The Partner Site Admissions Tracks (Site Track) affords prospective students the opportunity to apply directly to a given partner site. The requirement that laboratory rotations must be completed at two or more partner sites is waived for students admitted via a Site Track. The Site Tracks are funded by the partner site and there is no limit on the number of positions that a partner site can fund. There is no requirement for partner sites to offer a Site Track.

The Direct Admission Track is admission of an applicant directly into the laboratory of an eligible faculty mentor. Direct admits forfeit GSBSE support and their funding is at the discretion of their mentor. The requirement of laboratory rotations is waived for direct admits. The mentor of the prospective direct admit must notify the administration or Admissions Committee of their intent to sponsor the applicant.

3. FINANCIAL SUPPORT FOR GRADUATE STUDENTS

GSBSE supported Ph.D. students will be supported with a $30,000 annual stipend, tuition, and half of the cost of health insurance for the first year of the program during the rotations. GSBSE supported students are defined as students who are receiving their primary financial support from the GSBSE MEIF account. This typically includes students in their first year of the GSBSE Ph.D. programs that are not directly admitted to a faculty mentor's laboratory.

At the beginning of the student's second academic year (usually September), the mentor will then be responsible for providing the student's complete stipend, tuition, and half of the cost of health insurance. The level of stipend funding after the initial year and for direct admit students will be at the discretion of the institution/program; however, all attempts should be made to keep the stipend level of $30,000/annum. It should be noted that the student will only have to register for one thesis credit per semester after successfully completing the comprehensive examination.

Any additional expenses relating to education and cost of living shall be the responsibility of the student. This includes, but is not limited to, rent payments for housing either on or off campus, meal plans, course textbooks and required supplies, poster printing for conference presentations, computer equipment, etc.

Please note, that identifying housing and the associated expense are the responsibility of the student. Site administrators may be a resource to aid in identifying housing.

The primary funding mechanism for GSBSE students is the Graduate Assistantship system as administered by the UMaine Graduate School in association with the UMaine Bursar's Office and the UMaine System Human Resources. Alternate funding mechanisms can be used to support students but should be confirmed to properly support the student by the GSBSE administration.

3.1 Student Travel Reimbursement Policy

Hotel accommodations will be provided/reimbursed for GSBSE supported students to attend mandatory GSBSE events when the travel time is 2 hours or more in length for meetings starting at or before 8:00am and ending at or after 7:00pm. Students requesting a single room when sharing a room is an option may elect to pay for 50% of the total accommodation expense to have a single room. An expense request must be submitted and approved either through Concur or GSBSE administrative staff prior to travel. The permanent Dissertation Mentor is responsible for supporting the travel of all other GSBSE students.

Mileage reimbursements will be provided for GSBSE supported students to attend mandatory GSBSE events. An expense request must be submitted and approved either through Concur or a member of the GSBSE Administrative staff prior to travel, and students must carpool when possible. The permanent Dissertation Mentor is responsible for supporting the travel of all other GSBSE students.

4. ADVISING AND PLANNING FOR THE FIRST YEAR

Orientation for new GSBSE Ph.D. students will normally be scheduled the Friday before the start of the Fall semester in accordance with the UMaine Academic Calendar. New students should plan to attend.

Once accepted into either the Ph.D. in Biomedical Science or the Ph.D. in Biomedical Engineering program, and prior to the identification of a dissertation mentor, students will be advised by the GSBSE Director or Program Director. Issues and questions relating to laboratory rotations and coursework should be discussed with the GSBSE Director or Program Director. The GSBSE staff administrator may offer guidance on general questions or issues including those related to registration for classes.

By the time the student has completed laboratory rotations, the student will have chosen and be accepted by a dissertation mentor, found a home laboratory, and have begun assembling a dissertation committee. The role of advising in the academic programs will then fall to the mentor.

5. PROGRAM REQUIREMENTS

There are seven program requirements for completion of the Ph.D. programs of the GSBSE:

1. Laboratory Rotations
2. Course Requirements
3. Dissertation Committee Reporting and Meetings
4. Comprehensive Examination
5. Dissertation and Dissertation Defense
6. Publication
7. Attendance and Presentation of Research
    - Attendance at the GSBSE Annual Meeting
    - Attendance at GSBSE Monthly Student Meetings
    - Presentation of Research at the UMaine Student Symposium

A summary checklist of program requirements for these requirements can be found here.

5.1 Laboratory Rotations

Students desiring to perform dissertation work through the GSBSE open rotation track are required to complete at minimum three laboratory rotations, each lasting at minimum ten weeks. GSBSE requires that at least two partner institutions be represented in a student's rotation experience. These rotations are chosen by the student with the goals of providing experiences in diverse research areas and environments, and in the identification of a dissertation mentor. Please note, that identifying housing and the associated expense is the responsibility of the student. Site administrators may be a resource to aid in identifying housing.

At the end of each laboratory rotation, the student will provide a summary of her/his research achievements in the laboratory and an evaluation of the experience. The Principal Investigator (PI) will evaluate the performance of the rotation student and discuss this evaluation in detail with the student. Strengths and deficiencies will be noted; the PI may suggest coursework or study to correct any deficiencies that are identified. Both evaluations will be forwarded to the GSBSE administration and will become a permanent part of the student's file.

GSBSE Rotations – tips, suggestions, and a mentor-mentee compact

Purpose of rotations: One aspect that is critical for setting up successful rotations is to reflect on why you are beginning a PhD. PhDs are not particularly well structured, and it is important for students to know their goals because that will facilitate joining a lab that enables students to achieve their goals.

The main purpose of rotations is to understand how a potential student and the host lab/team work together, and whether a lab will enable you to be connected, engaged, and to flourish in graduate school.

It is thus important to understand your core values, so that when the lab values are communicated to you, you can determine whether a lab is a good fit. What are aspects of labs where you thrived, what was missing in labs where you didn't thrive? Thinking about these topics will help you assess potential rotation options as well as full rotations.

Pre-rotation:

1. Please set up 15-30 minute zoom meetings with potential faculty. Be prepared to answer questions about your values, work-life integration, why you are interested in particular research, and what your goals for your PhD are. You can also share with PIs what type of learner you are – how do you do your best work (For example, I have terrible procedural memory - I am very bad at watching someone do something and remembering how to do it myself. I used to take crazy detailed notes and drive people nuts asking them to slow down, nowadays I just take a video so that I can go back and make those crazy detailed notes).

2. During the meeting, ask faculty what their lab culture is, how much time in lab is expected, how much time out of lab is expected, how their lab views whether someone is a good fit for that lab. What does a successful rotation look like to them? Who will supervise your learning? How often will you meet with them?

3. Reflect on the interview and decide whether this is a good fit for you, then reach out to the PI and let them know.

During the rotation:

1. Keep an open mind throughout the rotation, get to know the lab environment in addition to learning about the research question.
2. Follow all lab rules and treat others with respect. Ask questions if you are confused – it doesn't benefit anyone if you pretend to understand. You are here to learn, it is ok to not know all the answers.
3. Follow the structure that has been set up for your rotation with you and the PI. Communicate clearly about expectations (from both sides) and whether these expectations are being met. This rotation is the opportunity for you and the PI to determine whether you communicate effectively, which is key for a successful PhD experience.

After the rotation: Reflect on your experience, write down your thoughts (this can be important so that the new shiny rotation doesn't eclipse the older, but better fit rotation). Some things to consider: Do you understand your mentor's approach to teaching and does it fit with your learning style, is conflict in the lab effectively and equitably managed, is conduct in the lab appropriate and professional, is there appropriate feedback (note that appropriate can include corrective feedback such as please do this instead of that because), will you be able to meet your training and career goals in this lab?

Mentor-Mentee Compact:

Student expectations of mentor:

1. Provide clear expectations for the rotation and how the student will be evaluated as a potential fit for the lab.
2. Clarify with whom the student will be training, and how often they will meet with you and the student/tech/post-doc with whom they will be working most closely.
3. Provide honest input. Meet with the student at the beginning, middle, and end of the rotation to provide and receive input.

4. Be supportive and respectful. The mentor will work to support the student's goals for the rotation and communicate honestly and effectively.
5. Contribute to an environment that is safe, equitable, and free of harassment.

Mentor expectations of student:

1. Take advantage of opportunities during the rotation – training opportunities, participate in journal clubs as requested, be an enthusiastic learner.
2. Follow lab rules and respect this training opportunity, recognize that reagents and time are valuable, and treat them with respect. Treat others in the lab with respect and work collegially with everyone in the lab. Contribute to an environment that is safe, equitable, and free of harassment.
3. Maintain detailed, organized, and accurate research records. Good record keeping is essential for your PhD. Mistakes happen, acknowledge them, apologize, and take steps to ensure they do not happen again (for example I've learned to rely heavily on alarms to ensure I don't get distracted and I do things when I'm supposed to do them).
4. Adopt a growth mindset, be willing to hear constructive feedback, and improve.
5. Communicate any planned absences in advance as well as unplanned absences due to illness or other issues.

GSBSE Rotations Mentor-Mentee Compact - please complete and return to GSBSE@maine.edu

5.2 Course Requirements

GSBSE Ph.D. students are required to complete at minimum 30 total credit hours of coursework comprised of at minimum 20 credit hours of coursework and at minimum 10 credit hours of thesis credits. GSBSE Ph.D. students are required to maintain full-time student status throughout their degree program, including during the Summer semester.

There are four mandatory courses that all GSBSE Biomedical Science Ph.D. students are required to complete.

The first course is Foundations to Biomedical Science and Engineering (BMS 625). This course consists of a series of four modules that provide a framework for an introduction to research in the field of Biomedical Science and Engineering. The four modules are:

- Genetics
- Biostatistics/Computational Biology
- Animal Physiology
- Biochemistry

The second course must pertain to Biocomputing or Biostatistics (e.g., BMB 502: Introduction to Bioinformatics or PSY 540: Advanced Psychological Statistics and Methods I).

The third course must pertain to Grant Writing (e.g., BMS 650: Grant Writing).

The fourth course must pertain to bioethics and scientific conduct (e.g., INT 601 Responsible Conduct of Research).

Additional course requirements will be unique for each GSBSE student and will be tailored depending on their degree (Ph.D. in Biomedical Science, or Ph.D. in Biomedical Engineering). Coursework will be determined by their dissertation mentor and committee. At least twenty total credits of coursework must be performed, and a total of thirty credits completed overall (including thesis credits).

Small changes to the BME curriculum will be announced August 20, 2022

5.3 Dissertation Committee Reporting and Meetings

5.3.1 Choosing A Dissertation Mentor(s)

Prior to the end of the first year, the student is expected to identify a mentor from their laboratory rotations; exceptions may be made with the Director or Program Director's approval. The administrations of the partner sites should also be notified and may have additional approval processes. The student will begin in the chosen laboratory at the conclusion of their laboratory rotations. During the first six months in the mentor's laboratory a specific and focused dissertation topic should be identified and a dissertation committee established. The mentor will serve as the student's listed advisor in the system of record for the duration of the degree with the UMaine Graduate School.

5.3.2 Choosing the Dissertation Committee

A Dissertation Committee consists of a student's primary mentor and 4 or 5 other GSBSE affiliated faculty members. Unaffiliated faculty who wish to serve on Dissertation Committees should pursue faculty affiliation following the process as defined in Section 8. REQUIREMENTS FOR GSBSE FACULTY. Dissertation Committees should include faculty from at minimum two GSBSE partner sites. The Dissertation Committee is led by the Dissertation Committee Chair, who is commonly but not required to be the dissertation mentor of the student. The purpose of the dissertation committee is to advise the student throughout the course of their research work, to evaluate the student's progress and strategy, and to assist with post-degree advising and planning. The choice of a dissertation committee is therefore critical.

5.3.3 Initial Committee Meeting

Once the committee is established and a student's dissertation project has been proposed, the initial committee meeting should take place. The goals of this committee meeting include:

1) approving the Program of Study, including identifying remaining course requirements
2) reviewing and approving the dissertation topic proposal
3) identification of the comprehensive examination chair. The examination chair must be a member of the committee but cannot be the committee chair and/or the dissertation mentor of the student, who sits on the examination committee as a non-voting, ex officio member.
4) establishing a timeline for comprehensive exam (see 5.4.1 Timeline for Comprehensive Examination)

In preparation for the initial meeting, the student should prepare and distribute, two weeks ahead of time, the Program of Study (pdf), which includes graduate course work taken or anticipated, grades earned, and a description of the proposed dissertation topic. All committee members will sign off on the Program of Study if it is deemed acceptable.

The signed and approved Program of Study must be submitted by the student to the GSBSE office for approval by the Director or Program Director. Once approved, the student must submit the Program of Study to the Graduate School. Any proposed changes in the research direction or plan of study must be discussed by the student at a convened committee meeting. The committee will then collectively grant approval of the new plan of study and documented in the Change in Program of Study form (pdf). The Change in Program of Study must be submitted to the GSBSE office for approval by the Director or Program Director, and subsequent filing with the UMaine Graduate School.

5.3.4 Regular Committee Meetings

Following the first committee meeting, the student will schedule regular committee meetings that will serve the purpose of reporting the progress of the student. The committee will meet at least twice a year (with an extra meeting for the comprehensive examination), or more frequently, as determined by mutual agreement of the student and their committee. It is the student's responsibility to prepare for the meeting by giving each committee member written materials at least one week before the meeting and preparing a progress report that will be presented orally at the beginning of the meeting. The first two pages of the Thesis Committee Evaluation form, available here, should be filled out by the student prior to the committee meeting. The student should assemble an agenda for the meeting that includes the progress report, goals for the following year, and specific details and data pertaining to his/her work. The student should also plan to follow up on the meeting in a timely manner by providing additional materials, updating timelines, goals, etc., as requested by the committee.

After each committee meeting, the student's dissertation chair will be responsible for reporting the progress of the student through filling out the third page of the Thesis Committee Evaluation form, available here link. The Thesis Committee Evaluation Form should then be signed by every member of the committee (an email confirmation to the GSBSE office will suffice) and the evaluation should be shared with the GSBSE student. At that time, concerns or problems should be discussed with the student and a plan to address these problems or concerns should be stated in the form.

5.4 Comprehensive Examination

5.4.1 Timeline for Comprehensive Examination

1. The comprehensive exam should be completed by the end of the second year (by the end of the second Summer semester after matriculation for those admitted in the Fall semester).
2. Any comprehensive examinations conducted after such a time require approval from the Director or Program Director. If there are circumstances that delay the comprehensive exam, the committee chair should communicate these to the GSBSE director and request permission for the student to have an extension.
3. An ideal timeline is for the student to talk about topics with the committee in Fall of their second year and receive approval to write an aims page for a topic, to have the aims page approved in winter-early spring, and to take their exams in spring-early summer.
4. The GSBSE Director's office administration should be notified by the student two weeks

in advance of when a Comprehensive Examination is scheduled.

5. The research proposal will be presented and defended orally by the student to the members of the committee at the Comprehensive Examination. Committee members will question the student about their proposal, as well as any related topics. All committee members must participate in the examination.

The Comprehensive Examination marks the formal entry into Ph.D. candidacy and consists of an oral and a written component. The student must independently prepare the written and oral Comprehensive Examination material without detailed input on writing or experimental design from the mentor or other faculty members. The examination will involve the preparation of a research proposal following the guidelines of an NIH postdoctoral fellowship proposal, or those of a modified NSF proposal, as appropriate for the topic selected. Detailed guidelines for each format may be found here link. The student must prepare the written and oral Comprehensive Examination material independently, without detailed input on writing or experimental design from the mentor or other faculty members.

5.4.2 Choice of Comprehensive Exam Chair

The chair of the Comprehensive Examination should be identified at the initial committee meeting. The chair of the Comprehensive Examination committee may not be the dissertation mentor but should be a member of the committee. The dissertation mentor shall serve on the Comprehensive Examination committee as a non-voting, ex -officio member.

5.4.3 Choice of Comprehensive Exam Topic

Ideally by or at their second year, Fall committee meeting, the student and thesis committee should determine the timeline and topic of the Comprehensive Examination. In advance of the committee meeting, the student should prepare and submit to the committee three separate, short one paragraph per comprehensive examination topic proposals with specific goals. Although the paragraphs are short, the student should be prepared to talk extensively with the committee about the three possible topics at the meeting. The student should be prepared to discuss the topics and prepare any necessary slides, support from the literature, and notes to aid your discussion. The student should check with their committee about any other expectations.

The topics proposed cannot be the same as the topic of any document written by the student in a previous or current grant writing course, nor be the subject of any grant proposal prepared by the dissertation mentor. The topics must be separate from the dissertation topic; however the topics may be “thesis-adjacent” to the student’s dissertation project. One way to think about thesis-adjacent is the project one might do if the current project doesn’t work.

The committee will discuss, provide feedback on which topic is best to pursue. If no topic is approved, the student will repeat the process with guidance from the committee. Most likely the committee will approve one topic for the Comprehensive Examination.

5.4.4 Specific Aims Page

Once approval for a topic is granted, the student will write a one-page Specific Aims page on the topic. The student will send the Aims page to the committee chair who will send the Aims page out to the committee and elicit email discussion.

The committee will give the student feedback on the Aims page within a month. This feedback could be approval to proceed with writing the rest of the grant proposal. This feedback could be constructive criticism on how to revise the Aims page for resubmission to enhance the probability of the student passing the exam.

Once the Specific Aims page is approved, the student can schedule their orals and write their grant. To give an idea of when to schedule the actual exam, the preparation should take at least 1-4 months of solid focusing on the writing of the grant proposal and then allow for additional weeks planned for preparing the oral presentation. You can improve your chances of success at your orals by practicing your presentation with your peers and answering your peers' questions. You must work independently without detailed input from the mentor or other faculty members.

5.4.5 Format of the Specific Aims Page and Written Portion of the Comprehensive Exam

The examination will involve the preparation of a written research proposal which must be formatted to follow the NIH postdoctoral fellowship proposal formatting F31-style grant proposal (Specific Aims page plus a 6-page research plan with Significance, Innovation, and Approach sections). Students can request permission to write a NSF style grant if that is more appropriate, but this needs to be agreed on in writing at the same time that the topic is chosen Detailed guidelines for each format may be found here link.

5.4.6 The Oral Portion of the Comprehensive Exam

The GSBSE Director's office administration should be notified at least two weeks in advance of when the Comprehensive Examination is scheduled and the student will send the written portion to their committee two weeks prior to the exam date.

In the unlikely circumstance that a major red flag is raised by the written grant (such as plagiarism), this must be communicated to the student at least 5 days prior to the scheduled exam. In this case, the committee chair would discuss this course of action with the faculty representative at the site and the GSBSE Director or Associate Director.

Committee members will question the student about the proposal as well as any related topics. Students should be prepared to defend their hypothesis, experimental design, model system, and explain expected outcomes. The ability to explain alternatives and situate your topic in the context of the field is useful. Concrete details are required but the ability to think logically is even more important. The orals are designed to measure the students' capacity to become independent scientists. All committee members must participate in the examination.
The oral exam should last between 1 and 3 hours. Committee deliberation shouldn't take longer than a half hour, with a maximum of 1 hour of deliberation. The committee will then communicate to the student one of three options:

1. The student passed
2. The student passed but the committee would like to see additional work done. This additional work is not formulaic – it could be rewriting an aim, rewriting the aims page, presenting their talk again – the goal of this is that the committee will choose what is best to help educate the student

3. The student failed. The committee will then promptly inform the GSBSE director/associate director *and* the faculty site representative of the results – within a half hour of informing the student. If the student failed, they will have 3 months to retake their comps. *Under extraordinary circumstances where it is clear from multiple documented lines of evidence (not just this exam) that the student will not successfully complete a Ph.D., approval to fail the student with no option to retake the exam may be requested from the GSBSE Director*.

5.4.7 After the Comprehensive Exam

If the student does not pass the examination, the committee will make recommendations and allow for one repeat of the examination. Failure to pass the Comprehensive Examination at the second attempt will lead to dismissal from the Ph.D. program. Once the examination is passed successfully, the student will become a candidate for the Ph.D. degree. Committee members may require additional coursework, self-study, or impose other requirements based on the student's performance in the Comprehensive Examination. Completion of the Comprehensive Examination must be reported to the Graduate School as well as the GSBSE office and subsequently filed with the Graduate School within one week of the end of the comprehensive exam using the Notification of Results of the Comprehensive Examinations form here link.

5.5 Dissertation And Dissertation Defense

Students are required to read the Thesis Guidelines from the University of Maine Graduate School describing the requirements for the written dissertation document, available here link. The Thesis Guidelines document from the Graduate School provides strict guidelines for the formatting of the written dissertation.

During the last year of study, the student is responsible for convening a meeting to discuss the expected timeline of the final year of the dissertation work. This meeting should clearly outline the steps required to fulfill the requirements of the program, as well as the predicted timeline of work in the final year.

Six months before the expected defense, the student will convene a pre-defense meeting. The details of the overall structure and content of the thesis, remaining experiments, publication status, and overall progress will be discussed and evaluated. The outcome of this meeting will determine if the student will be ready for graduation within the six month timeframe. This is a critical meeting that will ensure that the student will be properly prepared when the defense examination is administered.

The written dissertation must be submitted to the dissertation mentor at least six weeks before the proposed oral defense date. The mentor should read through the document and give approval for the defense to proceed. Approval should be based on the quality of the written product, the comprehensive scope of the document, and the student's ability to present and defend the dissertation. The committee should receive the dissertation for comment at least 2 weeks prior to the oral defense date, but this timeline is at the discretion of the committee and may be modified.

At this point, the written document should be in its final form and should include all corrections and revisions based on comments from the dissertation mentor. Further major experimentation

should not be required beyond this time, and it is expected that minor revisions to the written dissertation will occur based on committee feedback.

The oral defense consists of an open, public seminar, followed by a closed session with just the student and the committee. Both the dissertation and the oral presentation and defense must be satisfactory and comply with the committee's requirements. If either the oral presentation and defense or the written document is not of satisfactory quality, the student will not pass the final examination for the Doctorate degree. Documentation of the completion of the oral and written portions of the thesis must be submitted to the Graduate School and GSBSE using the form available here.

Please note: *The (pdf) must be signed by the mentor and committee members 24 hours or more before the dissertation defense.*

5.6 Publications

Students are expected to publish their work in high quality, peer-reviewed journals, in addition to submitting a written dissertation. Publication of at least one first-author paper in a peer-reviewed journal is required for graduation. A copy of a given students first, first-author peer-reviewed paper should be submitted the GSBSE office upon publication.

5.7 Participation And Presentation Of Research

Please note: *The GSBSE program must be acknowledged in all publications and presentations as the student's affiliation.*

5.7.1 The GSBSE Annual Meeting

GSBSE graduate students are required to attend the GSBSE Annual Meeting each year.

5.7.2 The GSBSE Monthly Student Meetings

GSBSE graduate students are required to attend the GSBSE Monthly Student Meetings usually held on the second Friday of each month at Noon virtually.

5.7.3 Presentation of Research at the UMaine Student Symposium

GSBSE graduate students are required to present at the UMaine Student Symposium held annually. GSBSE will provide travel support for students to attend these meetings in accordance with the GSBSE Travel Reimbursement Policies outlined above in the section titled 'Financial Support for Graduate Students'.

6. GSBSE STUDENT AFFILIATES

Non-GSBSE graduate students who are performing research in biomedical science and engineering may be appointed as GSBSE Student Affiliates. Students should be nominated by a GSBSE Faculty member. The nomination packet should include a letter of recommendation from the faculty member, and a curriculum vitae of the student. The GSBSE Director shall review nominations and approve as appropriate. The Director may refer cases to the Steering Committee as appropriate. GSBSE Student Affiliates may participate in GSBSE annual and other scientific meetings. GSBSE Student Affiliates may present posters, though not typically deliver oral presentations at GSBSE meetings.

7. STUDENTS WITH DISABILITIES

If you have a disability for which you may be requesting an accommodation, please contact the Director of Student Accessibility Services, 121 East Annex, 581-2319, as early as possible.
Website: https://umaine.edu/studentaccessibility/

8. REQUIREMENTS FOR GSBSE FACULTY

Faculty may apply for GSBSE faculty status by submitting a Record of Qualification (ROQ) to the GSBSE office. The form may be obtained through the GSBSE office or at this link. A faculty member will be considered for either Associate Faculty or Full Faculty status. An Associate member will be able to participate on graduate committees but may not be a dissertation mentor for a GSBSE student. A Full Faculty member will be able to mentor a Ph.D. student and participate on graduate committees.

In addition to requirements regarding holding a doctoral degree, having an active scholarly record, and having an independent laboratory with a current or recent funding record (or for junior faculty be actively seeking funding), to hold Full Graduate Faculty status a GSBSE Faculty Member must regularly attend the GSBSE Annual Meeting held in September and Faculty Meetings.

Faculty status is reviewed every 5 years. If a Full Faculty member has not met the requirements during the past 5 years, they will be moved to Associate Faculty status.

APPENDIX 1 GSBSE FACULTY CONTACT INFORMATION link

APPENDIX 2 GSBSE GRADUATE STUDENT CHECKLIST link

APPENDIX 3 GSBSE FACULTY CHECKLIST link