

**University of Maine**  
**Graduate School of Biomedical Science and Engineering**  
**Faculty & Ph.D. Student Handbook**  
**Last updated: July 2019**

**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 the degree granting institution of the consortium. Base funding for the GSBSE is permanently allocated from the UMaine 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.

***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/>).***

***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.

**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 the UMaine.

**ADMISSION**

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. 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. All committee members are nominated by Steering Committee and the Director or Program Director serves on the Committee as a non-voting, ex officio member.

Prospective students can apply for a position as a GSBSE supported student (see Financial Support for Graduate Students for more information) or direct admission. 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. Direct admission 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.

A strong applicant will have an undergraduate degree in the sciences, engineering, or related discipline, with an outstanding academic record and strong GRE scores. The general GRE examination is required for review by the GSBSE Admissions Committee. The subject examination is not required. 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
- GRE scores
- TOEFL scores, if appropriate
- Three letters of recommendation from professional or academic references
- Official academic transcript
- Any other relevant information that will aid in the evaluation of the applicant

Applications are accepted until January 1<sup>st</sup> for matriculation in the Fall semester of the same year. The application review process starts in early January. The Admissions Committee completes an initial review of all applicants to select candidates for telephone interviews for domestic students, and video conference interviews for international students. Finalists selected from the initial interviews are invited for on-site interviews for domestic students, or a second round of video conference interviews for international students. Notification of admission into the program occurs in the Spring.

### **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 has to select an academic advisor who is not his/her work supervisor, and the dissertation research must not overlap with his/her employment work duties.

### **FINANCIAL SUPPORT FOR GRADUATE STUDENTS**

GSBSE supported Ph.D. students will be supported with a \$23,000 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 \$23,000/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 text books 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.

### **Student Travel Reimbursement Policy**

1. 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.

2. 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.

### **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 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 assembled a dissertation committee. The role of advising in the academic programs will then fall to the mentor.

## **PROGRAM REQUIREMENTS**

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

- Laboratory Rotations
- Courses
- Dissertation Committee Reporting and Meetings
- Comprehensive Examinations
- Dissertation and Dissertation Defense
- Publication
- 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 or Maine Biological and Medical Sciences Symposium

### **Laboratory Rotations**

Students desiring to perform dissertation work through the GSBSE 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.

### **Course Requirements**

There are four mandatory courses that all GSBSE Ph.D. students are required to complete. The first course is Introduction to Biomedical Science and Engineering (BMS 625). This course is comprised 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 last 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).

## **CHOOSING A DISSERTATION MENTOR(S)**

During the summer 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 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 thesis committee established.

## **Dissertation Committee Reporting and Meetings**

### **Choosing the Dissertation Committee**

A dissertation committee consists of a student's primary advisor and 4 or 5 other faculty members. At least one of the faculty members must be from a GSBSE partner institution that is different from the primary advisor's institution. The primary advisor 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, and to evaluate the student's progress and strategy. The choice of a dissertation committee is therefore critical.

### **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) identifying remaining course requirements, 2) approving the dissertation proposal, and 3) establishing a time-frame and topic for the candidacy examinations as well as identification of an 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. In preparation for this meeting, the student should prepare and distribute 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 Program of Study must be submitted to the GSBSE office for approval by the Director or Program Director, and subsequently filed with the Graduate School. Once a committee is established, 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. The revised Program of Study must be submitted to the GSBSE office for approval by the Director, and subsequent filing with the Graduate School. 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 his/her committee. After each committee meeting the advisor must submit an evaluation/update of the student's progress to the Director. This progress report should be shared with the student, and if needed, corrective action should be taken.

### **Committee Meetings**

Following the first committee meeting, the committee will conduct regular committee meetings that will serve the purpose of reporting the progress of the student. A committee must meet at least twice every year, but may meet more frequently at the discretion of the committee members. 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 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.

The student's mentor will be responsible for reporting the progress of the student through a

Dissertation Committee Summary (pdf) form after each committee meeting. The form is available here [link](#). The Committee Summary should 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.

### **Comprehensive Examinations**

At the first committee meeting, the student and thesis committee should determine the time and topic of the Comprehensive Examination, which marks the formal entry into Ph.D. candidacy. The comprehensive examination must be completed no later than the end of the summer of the student's second year in the program and any comprehensive examinations conducted after such a time require approval from the Director or Program Director. 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. In advance of the initial committee meeting the student should prepare and submit to the committee three separate, one paragraph comprehensive examination topic proposals with specific goals. 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 related to the student's dissertation project. The committee will discuss, provide feedback on, and approve a topic for the Comprehensive Examination. 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 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 research proposal will be presented and defended orally by the student to the members of the committee. Committee members will question the student about the proposal as well as any related topics. All committee members must participate in the examination. The GSBSE administration should be notified two weeks in advance of when a Comprehensive Examination is scheduled. 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. Completion of the Comprehensive Examination must be reported to 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](#) (pdf). Committee members may require additional coursework, self-study, or impose other requirements based on the student's performance in the Comprehensive Examination.

### **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](#). 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 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 Thesis Guidelines document from the Graduate School provides strict guidelines for the formatting of the written dissertation. The oral defense consists of an open seminar, followed by a closed session with the student and the committee. Both the dissertation and the oral presentation must be satisfactory and comply with the committee's requirements. If either the oral presentation 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 [Tentative Thesis Acceptance form](#) (pdf) must be signed by the mentor and committee members 24 hours or more before the dissertation defense.

### **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 student's first, first-author peer-reviewed paper should be submitted to the GSBSE office upon publication.

### **Attendance and Presentation of Research**

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

#### ***Attendance at the GSBSE Annual Meeting***

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

#### ***Attendance at the GSBSE Monthly Student Meetings***

GSBSE graduate students are required to attend the GSBSE Monthly Student Meetings.

#### ***Presentation of Research at the UMaine Student Symposium or Maine Biological and Medical Sciences Symposium***

GSBSE graduate students are also required to present at either the UMaine Student Symposium held annually at the Cross Insurance Center in Bangor, ME or the Maine Biological and Medical Sciences Symposium (MBMSS) held annually at the Mt. Desert Island Biological Laboratory. 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'.

### **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.

### **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/>

### **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 she/he will be moved to Associate Faculty status.

### **Faculty Travel Reimbursement Policy**

GSBSE will support mileage reimbursements for GSBSE faculty to attend a meeting of one of the GSBSE administrative committees (Admissions, Curriculum, Steering) when a meeting via videoconference is not a viable option. All travel reimbursements must be pre-approved via an expense request through Concur or sent directly to a member of the GSBSE Administrative staff. Faculty must carpool when possible to be eligible for mileage reimbursement.

### **EXTERNAL LINKS:**

GSBSE Committee Members and Contact Information: <https://gsbse.umaine.edu/staff-committees/>

GSBSE Graduate Student Checklist: <https://gsbse.umaine.edu/wp-content/uploads/sites/142/2017/07/GSBSE-Timeline-and-Checklist-1.pdf>

GSBSE Faculty Checklist: <https://gsbse.umaine.edu/wp-content/uploads/sites/142/2017/06/GSBSE-Faculty-Criteria-Summary.pdf>