



**2017-2018**

# **Department of Biology Graduate Program Guide**



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## Department of Biology Administration

### Chair

Kim McCall

### Associate Chairs:

*Cell & Molecular Biology*

Francisco Naya

*Neurobiology*

Angela Ho

*Ecology, Behavior, and Evolution*

Pamela Templer

### Assistant to the Chair

Jennifer Scott

### Director of Graduate Studies

Peter Buston

### Graduate Program Specialist

Christina Honeycutt

### Graduate Committee:

*Chair*

Karen Warkentin

*Ecology, Behavior, and Evolution*

Sean Mullen (Fall)

Jenny Bhatnagar (Spring)

*Cell & Molecular Biology*

Cynthia Bradham

*Neurobiology*

Ian Davison

### Business Manager

Sara Martin

### Financial Administrator

Rich Rigolini

### Senior Accounts Analyst

Barbara Caloggero

### Director of Undergraduate Studies

Dean Tolan

### Undergraduate Program Specialist

Stacy Straaberg Finfrock

### Program Coordinator

Diana Hughes

### Staff Coordinator

Madelyn Davis

### Purchasing/Facilities Manager

Thomas Symancyk

### Program Coordinator (stockroom)

TBA

### Mass Spectrometrist

Robert Michener

### Biology Workshop Supervisor

Jonathan Perry

### Director of Instructional Labs

Kathryn Spilios

### Laboratory Supervisor

Fred Earthrowl

### Administrative Coordinator, Instructional Labs

Chenille Hogan

### Laboratory Supervisor

Barkha Shah

### Laboratory Supervisor/Aquarist

Justin Scace

### Anatomy Lab Coordinator

Dale Pasino

### Physiology Lab Manager

Angela Seliga

### Imaging Laboratory Manager

Todd Blute

## Biology Graduate Program Administration

The goal of the Biology Department at Boston University is to train students at the highest level in one of three broad sub-fields within modern Biology. Upon completion of the M.A. or Ph.D., students should be prepared for post-graduate training and on track to assume teaching and/or research positions in academia, industry, government agencies or non-government organizations. Those who decide to leave academia should feel well prepared to apply their skills in legal and/or consulting professions.

The Director of Graduate Studies oversees academic programs and policies at the graduate level in the Department of Biology. In addition, there is a Graduate Committee, consisting of the Chair of the Committee and department faculty representing the three programmatic areas in the Department (Ecology, Behavior and Evolution; Cell & Molecular Biology; Neurobiology). The Committee Chair and members of the Committee are appointed by the Chair of the Department. The Graduate Committee is responsible for the programs of continuing students, allocating Department Travel and Research Grants, and maintaining overall standards in the Graduate programs.

## Important Links

**Biology Website** - <http://www.bu.edu/biology/>

**GRS Website** - <http://www.bu.edu/cas/students/graduate/>

**GRS Bulletin** - <http://www.bu.edu/academics/grs/>

**International Students & Scholars Office (ISSO)** - <https://www.bu.edu/isso/>

**StudentLink** - <https://www.bu.edu/students/academics/link/>

**Student Central** - <https://www.bu.edu/students/>

## Facilities for Training and Research

*All Charles River Campus Buildings are Non-Smoking!*

### **Biology Research Building (BRB), 5 Cummington Mall**

This building houses departmental administrative offices, research laboratories, and offices of faculty primarily in the Ecology, Behavior & Evolution (EBE) and Marine Biology (BUMP) programs. It also houses departmental common facilities, including the Aquarium Room, Stable Isotope Laboratory, DNA Sequencing and Molecular Biology Facility, Workshop, Instrument Rooms, Environmental Rooms, a graduate student lounge, seminar rooms, and two classrooms.

### **Biological Science Center (BSC), 2 Cummington Mall**

This building houses research laboratories, and offices for faculty and graduate students in Cell & Molecular Biology (CM).

### **Life Sciences & Engineering Building (LSE), 24 Cummington Mall**

This building houses a centralized stockroom, the offices and laboratories of faculty members in Cell & Molecular Biology (CM) and Neurobiology (NEURO) as well as departmental common facilities, including instrument rooms and environmental rooms. It also houses departmental common facilities, including the Electron Microscope and Confocal Imaging Facility and the Biology Media Center.

### **Metcalf Center for Science & Engineering (SCI), 590 Commonwealth Avenue**

This building houses the administrative offices for Introductory Biology and the departmental teaching laboratories. Laboratories for Introductory Biology are located on the third floor (west side). The fourth floor houses upper-division teaching laboratories. This building also houses the University-wide Laboratory Animal Care Facility, and public lounges, as well as the teaching laboratories, offices, and research laboratories of the Departments of Chemistry and Physics.

### **Science & Engineering Library (SEL), 38 Cummington Mall**

This library contains most of the University's holdings in the areas of Science & Engineering. More general holdings are located in Mugar Library at 775 Commonwealth Avenue. On-line catalogue and journal access is available at both libraries, as well as any departmental computer terminal.

## Research Material Ownership

All M.A. and Ph.D. students should be aware that Boston University serves as the guardian of research conducted at Boston University, including research supported by all Government agencies and most private foundations. This has several implications.

- Patents that arise from research conducted at Boston University are the property of Boston University, as outlined in the Faculty Handbook.
- Students are required to leave all original data and notebooks at Boston University upon completion of their studies. Students may take copies of their original research data and notes.

## Grades and Academic Standing for Graduate Students

### *Student responsibilities:*

As outlined in the Graduate School Bulletin, the Graduate School allows no more than eight credits with a grade less than B- (C+ or lower) and the Biology Department requires maintenance of a 3.0 GPA to remain in good academic standing and to be eligible to complete the graduate degree. Teaching grades are not included in calculating the GPA. A student receiving a grade lower than B- in a graduate course will be counseled by his or her faculty advisor and the appropriate member of the Graduate Committee. A student who receives a second grade lower than B- will be counseled by the Director of Graduate Studies, and will lose good academic standing in the Biology Department. All Departmental guarantees including financial support guarantees are dependent on being in good academic standing.

The Director of Graduate Studies will advise any student on academic probation of the specific time frame (generally within two semesters) during which the student must re-establish a cumulative GPA of 3.0 and, thus, regain good academic standing. Failure to meet these requirements within the specified time, or receipt of a third grade lower than B- will result in a recommendation to the graduate school of termination of the student's enrollment at the University. Appeals of the decision to recommend termination may be made to the Graduate Committee.

### *Faculty responsibilities:*

The faculty advisor and the Director of Graduate Studies are responsible for monitoring the academic performance of each graduate student each semester. These individuals generally notify the Graduate Committee of any student who receives a grade below B-. The Director of Graduate Studies will inform the Graduate Committee of the requirements for regaining good academic standing for any student placed on academic probation. The Graduate Committee will serve as the venue for student appeals.

## Requirements for the Master of Arts Degree (M.A.) in Biology

*Note: Individual program requirements may be more specific.*

### Time Limits

Officially, Research and Non-Research Master's degree requirements must be completed within three years from the date of first registration. However, students may apply to the Graduate School for extensions past the three-year deadline. M.A. degrees are conferred in May, September, or January, as specified in the Graduate School Bulletin.

### Faculty Advisors

Each graduate student admitted to the M.A. Degree program is assigned a faculty advisor. The appropriate Research or Library Research Paper committee of the student should be formed no later than the first year of full-time graduate study.

### Course Requirements

*Courses will vary depending on program discipline.* All Master's students must complete at least 32 credits of graduate work (as detailed below for each type of Master's degree in Biology). Two courses (8 credits) may be transferred to BU from another university upon approval of the Director of Graduate Studies and GRS.

### Transfer of Credits

Students may make the request for transfer credit through the online Transfer of Credit Request Form from GRS. There are specific steps for requesting transfer credit:

1. Students must submit the form online for the credits they are looking to transfer from another institution. The form first comes to the GRS Records Office to check if these specific courses are eligible to be transferred in accordance with GRS policy.
2. If the courses are eligible, GRS will forward the request via email to the Director of Graduate Studies (copying the administrator) for review and approval.
3. GRS staff will never apply credits to a student's record without approval from the program.

### Types of M.A. Degrees

- **Research Master's (with thesis)**

*Course Work:* The student must complete at least 32 credits of graduate level work. At least 20 of these graduate level credits must come from formal course work (i.e., cannot include credits from any research course).

*Research Thesis:* The student must write a thesis detailing original research that was conducted under the sponsoring faculty member. The thesis will generally include the following sections: Abstract, Introduction, Materials & Methods, Results, Discussion, References, and figures and/or tables summarizing research. The thesis must be read and approved by a committee of three faculty members that includes at least two faculty members from the Biology Department; one committee member must be the faculty member who acted as the Major Professor for the student's research. Ordinarily the student will receive written comments from all committee members that she/he is required to incorporate into a final

version of the thesis. Upon satisfactory completion of revisions, the readers must sign and approve the signature page of the final version of the thesis. The thesis title must be approved by the Graduate School of Arts & Sciences and a properly formatted draft of the thesis must be submitted by email to [grsrec@bu.edu](mailto:grsrec@bu.edu) for format review at least three weeks before the thesis is due. The final reader-approved thesis must be submitted to the Electronics Thesis and Dissertations (ETD) Administrator (<http://www.etdadmin.com/bu>) for final approval by the graduate school before the date posted on the GRS submission calendar. The final electronic version will be reviewed by GRS, and then forwarded to the Mugar Library ETD Administrator for the final format review, before its submission to ProQuest/UMI Administrator. Additionally a copy should be given to all committee members, the Department, and one copy should be kept by the student. An oral defense, while not required, is strongly recommended. Details on thesis submission dates can be found at: <http://www.bu.edu/cas/students/graduate/graduation-information/>

- **Non-Research Master's (with Scholarly Review Paper)**

*Course Work:* The student must complete 32 credits of graduate level course work. Ordinarily, these courses will be selected under the mentorship of the faculty member who is serving as the student's primary library research paper reader (see below).

*Library Research Paper:* The student must write a Library Research Paper on a selected topic in Biology. This paper will generally be a document of 30-80 pages on a selected research topic in current Biology and will usually include several chapters and extensive literature references. This paper will be written in consultation with a faculty member from the Biology Department who will serve as the primary reader. The final version of the document must be read and approved by at least two faculty members (i.e., the primary reader and one other faculty member) from the Biology Department. A final copy must be given to all committee members, the Department, and one copy should be kept by the student. The library paper is not submitted to GRS.

- **Master's of Arts for Ph.D. students (Two options)**

*Option one:* A Ph.D. student who has advanced to candidacy (as demonstrated by passing the Ph.D. qualifying exam), and has completed 32 credits of graduate level course work (not including research) may apply to the Graduate School for a Master of Arts degree in Biology. This must be approved by the Director of Graduate Studies within the Biology Department. The student's major professor will receive notification of this application process.

*Option two:* A Ph.D. student who has not been advanced to candidacy based on the Ph.D. qualifying examination may still receive a Master's degree. This student may receive a Master's degree if at least three members (including at least two faculty members from the Biology Department) of the Ph.D. qualifying examination committee vote that the student's performance on the qualifying examination was of sufficiently high quality for a Master's degree. In addition, this student must have completed at least 32 credits of graduate level course work.

## GRS M.A. Graduation Deadlines (with Biology Program deadlines)

### Master's with Scholarly Review Paper Deadlines

<input type="checkbox"/>	Intent to Graduate Form completed online	May 31, 2017	September 30, 2017	January 26, 2018
<input type="checkbox"/>	First draft of scholarly review paper to be submitted to readers	1st week of July	1st week of October	1st week of March
<input type="checkbox"/>	Final copy sent to Graduate Program Specialist	1st week of September	1st week of January	1st week of May

### Master's with a Research Thesis Deadlines

*All degree requirements are complete only when the master's thesis has been certified as meeting the standards of the Graduate School of Arts and Sciences and of the Mugar Memorial Library*

	Deadline Dates for:	September 25, 2017	January 25, 2018	May 18, 2018
<input type="checkbox"/>	Intent to Graduate Form completed online	May 31, 2017	September 30, 2017	January 26, 2018
<input type="checkbox"/>	First draft of thesis to be submitted to readers	1st week of July	1st week of October	1st week of March
<input type="checkbox"/>	Properly formatted draft of thesis submitted as a .pdf to grsrec@bu.edu	No later than July 22nd	No later than Nov 17th	No later than March 15th
<input type="checkbox"/>	Last date for submission of Thesis to ETD, Thesis Processing Fee, and signed Approval Page to GRS Office, and Contact Information form	August 11, 2017	December 8, 2017	April 6, 2018

# Requirements for the Doctor of Philosophy Degree (Ph.D.) in Biology

*Individual program requirements may be more specific.*

## Time Limits

Officially, the Ph.D. must be completed within seven years after the first registration for doctoral study. Ph.D. degrees are conferred in either May, September, or January, as specified in the Graduate School Bulletin. In addition, the Ph.D. candidacy expires after the fifth anniversary of passing the Qualifying Examination. Petitions to extend this deadline are possible at the discretion of the Director of Graduate Studies, the Department Chair, and the Dean of the Graduate School and can be obtained from the Office of the Graduate School of Arts & Sciences.

## Teaching Requirement

The department requires a minimum of two semesters of teaching during a student's graduate career as part of the Ph.D. degree. During the first semester of teaching, students are required to enroll in our first year seminar course, BI697. The course provides guidance and training on pedagogy and other aspects of graduate school.

## Responsible Conduct in Research (RCR)

All Biology Ph.D. students are required to begin the Responsible Conduct in Research (RCR) training during their first year, and complete it within four years of entering the program. RCR is offered through the Provost's Office and involves online modules and a series of afternoon training sessions of lectures and round table discussions covering topics such as proper data acquisition and management, research collaboration ethics, publication do's and don'ts, social responsibility in research, research that involves human subjects, and research that involves animals. Information about this series will be provided at appropriate times during the academic year. See <http://www.bu.edu/orc/training/responsible-conduct-of-research/>

## Course Requirements

*Courses will vary depending on program discipline.*

- 64 credits
- No more than 32 research credits (the rest must be formal courses)
- A maximum of 8 courses (32 credits) may be transferred to BU from other institutions
- At least 16 credits must come from formal courses taken at BU
- GRS BI 699 course for which all teaching fellows register does not count toward these requirements; credits for this course are not tallied as part of the total credit count.

## Transfer of Credits

Students may make the request for transfer of credits through the online Transfer of Credit Request Form from GRS. If the courses are eligible, GRS will forward the request via email to the Biology Director of Graduate Studies (copying the administrator) for review and approval. Further details on transfer of credits can be found here: <http://www.bu.edu/academics/grs/policies/transfer-of-credits/>

## Research Courses

Consult your advisor for the specific number of research credits that you should register for each semester. The following can be used as a guide however it is important to review the course credit requirements for your program and your individual academic progress and funding in consultation with your advisor:

*Only registering for research credits (not teaching)* - register for 6 credits of research

*Only registering for research credits (and teaching)* - register for 4 credits of research

*Registering for courses and research credits (not teaching)* - register for 4 credits of research

*Registering for courses and research credits (and teaching)* - register for up to 2 credits of research

## Faculty Advisory Committee

All Biology graduate students are paired with a primary research advisor (major professor), who is a member of the Biology faculty and who serves as first reader on the student's thesis. All students admitted to the CM and Neurobiology Ph.D. program are assigned a temporary faculty advisor. By the end of the second semester of the first year a permanent major advisor should be selected. No later than the end of the third year, the student, in consultation with the major advisor, should have selected a committee consisting of five persons to serve as a Faculty Advisory Committee (FAC). The FAC shall include the research advisor and at least two other faculty members from the Department of Biology, one of whom will serve as the Chair of the Committee for the qualifying examination. The fourth and fifth members of the Committee may be chosen from other faculty of Boston University or from other institutions upon approval of the Director of Graduate Studies, the Department Chair, and the Dean of the Graduate School. (For faculty outside BU, a "Special Service Appointment Form" must be filled out, including a copy of the proposed committee member's curriculum vitae, and then submitted to the Department Chair. These forms are available on the GRS website.).

Once each subsequent year, the student and his/her major professor must jointly convene the Faculty Advisory Committee to evaluate the progress of the student. It is recommended that this meeting coincide with the annual research presentation at the student seminar. The student should be prepared to present a written and/or oral report on research progress to the committee. Deficiencies in course work, research activity, etc. should be noted, and recommendations, if needed, should be made to the student and included in his/her annual report. Students failing to comply with these recommendations may be subject to probation and loss of financial support from the Department. Generally, the composition of the Faculty Advisory Committee remains the same for the duration of the student's graduate program. Changes in committee membership can be made by mutual agreement among those involved, but the final dissertation committee must meet the membership requirements listed above.

## Qualifying Examination

A Ph.D. student is required to complete a written and oral qualifying examination in his/her field of specialization and related fields as defined by the Faculty. The Faculty Advisory Committee will prepare and administer each phase of the examination. This examination must be passed within the first three years of residence at Boston University. Failure of any part of the examination constitutes failure to advance to candidacy. A student has two chances to pass the examination. A

second failure generally results in dismissal of the student from the graduate program. Individual graduate programs within the Biology Department may have more specific guidelines for candidacy and the qualifying examination.

## Dissertation

Responsibility for the successful completion of the dissertation lies with the candidate, who, through insight, initiative, and resourcefulness, shall make a definitive contribution to the knowledge of his or her specialized field. A timetable for the preparation and defense of the dissertation can be found at the end of this section.

### Preparation and Submission of a Biology Ph.D. Dissertation

Conferral of the Ph.D. degree in Biology requires the successful preparation and defense of a Ph.D. dissertation on original research conducted by the student. A precise timetable for completion of essential steps in submission of a Ph.D. dissertation can be obtained from the Graduate School website. Those steps and Biology Department requirements and guidelines are summarized briefly here.

- **A student must have a Dissertation Committee that includes at least five faculty members.** This committee must include at least three full time faculty members from the Biology Department. One Biology Department member of the Dissertation Committee will be the student's research advisor, who will generally be the first reader of the dissertation. A second member of the committee will serve as the second reader. A third Biology Department member of the committee will serve as Chair of the Dissertation Defense (see below). Neither first nor second readers may be the chair of the committee.
- **Approximately one year prior to the proposed graduation date, a formal Dissertation Prospectus must be submitted to the Graduate School Office.** This document should be prepared in consultation with and with approval of the first and second thesis readers, the Director of Graduate Studies, and the Biology Department Chair. It is recommended that the student discuss the prospectus at an annual committee meeting prior to submission, or otherwise email the committee for approval. The prospectus generally provides an outline of the major chapters and subheadings to be included in the Ph.D. dissertation. Each chapter listed in the prospectus should include an abstract that describes what problem will be investigated, what results will be shown and what conclusions will be drawn in the chapter. The abstract should then be followed by a number of points, outlining the major specific results (or lists of figures and tables) that will be presented in that chapter in the final dissertation. The formal Prospectus will generally be approximately 5 to 10 typed, double spaced pages, but no more than 20.
- **Approximately two months before the defense, the student and the first reader should meet with the Director of Graduate Studies and the Biology Department Graduate Program Specialist to review the timeline and requirements for graduation.**
- **At least three weeks prior to the Dissertation Defense:**
  - a. **An Abstract of the dissertation and Schedule of Final Oral Examination form must be submitted to the Graduate School Office.** This Abstract (maximum of 350 words) must be approved by the first and second readers, the Director of Graduate Studies

and the Chair of Biology. A schedule of the Final Oral Examination (time, place and list of Dissertation Committee members) must be submitted to the Graduate School Office, along with a copy of the approved Dissertation Abstract.

**b. Submit draft of dissertation to [gsrec@bu.edu](mailto:gsrec@bu.edu) by attaching the draft to an email message.** You will be notified if the format is approved. Because the formatting of the dissertation can be time consuming; it is advised that all formatting issues be resolved before you defend your dissertation. Following your defense, you should allow ample time to complete all corrections and content revisions that are required by your committee; students are advised to allow at least 7-14 days for revisions.

Six videos that will be helpful to you when formatting your dissertation are located at BUiverse at: [http://www.bu.edu/buniverse/search/?q=&sort=created\\_on&view=detailed&owner=dioa](http://www.bu.edu/buniverse/search/?q=&sort=created_on&view=detailed&owner=dioa)

- **At least two weeks prior to the Dissertation Defense, all work that comprises the dissertation, which is prepared as described below and approved by both readers must be distributed to all members of the Dissertation Committee.** The student should prepare the dissertation in close consultation with the first and second readers. Ordinarily the dissertation will go through several revisions by the first reader, followed by one or more revisions by second reader.
- **The Graduate School Office will email a formal announcement to all committee members. The Chair of the Dissertation Committee will receive important paperwork needed at the defense.**
- **A formal announcement of the Dissertation Seminar and Defense should be made in several ways.** It is the responsibility of the student to see that the following matters are taken care of: A booklet containing an announcement of the Dissertation Seminar and Defense, the Dissertation Abstract, and a brief CV of the candidate must be distributed to all Biology Faculty. This must be prepared by the student and can be given to the Graduate Program Specialist for printing and distribution. A template for the flyer is provided by the Graduate Program Specialist. Usually the Dissertation Seminar is also publicized by informal posters and e-mail (arranged with the Graduate Program Specialist).
- **A formal Biology Department Dissertation Seminar, for which all five Dissertation Committee members are present, must be given by the Ph.D. candidate.** This electronic graphics (e.g., PowerPoint) presentation on the dissertation research will ordinarily last 45-50 minutes and is open to the public. This seminar is usually given immediately before the dissertation defense, but under unusual circumstances may be accommodated by prior arrangement with the Committee and the Director of Graduate Studies.
- **The student must also pass a private Dissertation Defense in front of the Dissertation Committee (at least five members must be present).** By prior arrangement one off-site member of the committee may participate via Skype with interactive video and audio, however a backup committee member must be available in the event of technical difficulties. The Dissertation Defense is ordinarily a time where committee members ensure that the research has been completed by and is understood by the candidate, and will voice any concerns over data or the preparation of the dissertation. The Dissertation

Defense usually lasts 1-2 hours. More than one failing vote on the Dissertation Defense will constitute a failure. Because the signature of the First Reader is required on the dissertation (see below), the First Reader must be one of the committee members passing the student on the Ph.D. Dissertation Defense.

- **Following the defense and when all corrections and revisions required by your committee have been completed, the final approved dissertation is submitted electronically to the ETD Administrator (<http://www.etsadmin.com/bu>).** Ordinarily the student receives written comments from all committee members that they are required to incorporate, in consultation with the first and second readers, into a final version of the dissertation. Upon satisfactory completion of revisions, the first and second readers must sign and approve the final version of the dissertation. The final electronic version will be reviewed by GRS, and then forwarded to the Mugar Library ETD Administrator for the final format review, before its submission to ProQuest/UMI Administrator.

If the student does not want his or her dissertation or thesis to be available from ProQuest or the Digital Common immediately after it is submitted an embargo can be requested. For any time period (6 months, one year, or two years), you must submit a letter requesting a restriction along with the PDF of the thesis or dissertation through ProQuest's ETD Administrator. The letter must explain the compelling reason for the restriction, the time limit desired, an address where you can be contacted when the time limit expires, and the signed approval of both you and your major advisor. These letters are reviewed and if appropriate approved by the associate dean. The restriction will start from the date on the letter. Learn more on the GRS website.

*Please note: If either office notifies you of necessary corrections or changes, they must be made immediately. A quick response will avoid your registering for another semester, a delay in verifying the completion of your degree requirements, and the issuing of the diploma. It may take some time before the final library review is complete.*

- **The student should also give final copies to the first and second readers (and, when requested, other members of the Dissertation Committee), and should retain at least one final copy for him or herself.** Some committee members may prefer pdf copies of the dissertation.

**Organization of the Biology Ph.D. Dissertation:** A set of rules concerning page sizes, page numbering, etc., of the dissertation can be obtained on the Graduate School website under *Dissertation Formatting Guide and Draft Submission*. The Graduate School rules must be strictly followed.

Below are the guidelines, which are generally applicable to Biology Ph.D. dissertations. The format of the complete dissertation document submitted at the time of the defense should meet the specifications of the Graduate School for final submission of the dissertation as well as these guidelines that follow. In general, the dissertation is organized in one of two formats. The exact format to be followed is usually decided by the student and the first and second readers.

### 1. Comprehensive Dissertation

This type of dissertation normally includes, in order, the following sections: Title Page, Approval Signature Page, Acknowledgments, Abstract, Table of Contents, List

of Figures, List of Tables, List of Abbreviations, several Chapters, and a comprehensive Reference List. The comprehensive dissertation should have a consistent style format in all chapters. For example, Materials & Methods from multiple papers can be combined into a single consistent Materials & Methods chapter, References should be cited consistently throughout the dissertation, and there should be a single Introduction, Discussion, and Reference List.

Chapter One usually provides a general and specific Introduction to the dissertation. This will include an overview of the importance of the work, a specific introduction to the field, and a statement of the dissertation goals.

Chapter Two usually details the Materials & Methods used in the dissertation work.

Chapter Three (and more) describes the Results obtained from the dissertation work. These chapters include figures, tables and descriptions of original work. Often these chapters have short introductions to provide a framework for the results that will follow. Figures and tables must have appropriate legends.

The final Chapter should include a specific and general Discussion of the dissertation work in light of other work in the field.

## 2. Partitioned Dissertation

This type of dissertation normally includes, in order, the following sections: Title Page, Approval Signature Page, Acknowledgments, Abstract, Table of Contents, List of Figures, List of Tables, List of Abbreviations, several Chapters, and a comprehensive Reference List.

Chapter One usually provides a general and specific Introduction to the dissertation. This includes an overview of the importance of the work, a specific introduction to the field, and a statement of the dissertation goals.

Chapter Two (and more) presents the Results of the dissertation research organized in a research paper format. That is, each chapter includes the following material as pertinent to the research included in the given chapter: Introduction: Materials & Methods, Results, Discussion and Specific Reference List.

The final Chapter presents a summary of the original research accomplished in the thesis work, and its relevance to the large field, and perspective for future work.

To be consistent with Graduate School rules, the partitioned dissertation must also include a comprehensive Reference List.

### Specific Guidelines for Presentation of Research and Data

In all cases, details for the presentation of original data should be worked out between the student and the first and second readers. However, the following can be used as guidelines:

- i. **Large parts of the written dissertation may be taken or adapted from material already published by the student.** However, published papers cannot be simply

digitally pasted together. In addition, care must be taken to appropriately identify work done by others in such papers.

**ii. In general, all data relevant to the dissertation should be included in the dissertation.** It is usually not acceptable to list primary, relevant data as “data not shown” or refer to the student’s data published in another source.

**iii. It is recognized that all figures within the dissertation may not be in a consistent format.** For example, figures may have been taken from published articles in journals with different format requirements. In general, it is not necessary to re-make figures for the dissertation. Any work done by others, such as co-authors, must be strictly attributed to them if it needs to be included in the student’s dissertation.

### Specific Guidelines for Scholarship and Citation

References must be listed and cited according to a standard and consistent journal format. The full title of each journal referenced must be included unless the reference list is preceded by a list of all journal abbreviations used.

**i. The Reference List must include authors, year published, title of article, journal, volume and inclusive pages.** The following provides examples of a suggested format for references:

Gilmore TD, White DW, Sarkar S & Sif S (1995) Malignant transformation of cells by the v Rel oncoprotein. In, The DNA Provirus: Howard Temin’s Scientific Legacy (Cooper GM, Greenberg Temin R & Sugden B, eds), American Society for Microbiology, Washington DC, pp 109 128

White DW & Gilmore TD (1993) Temperature sensitive transforming mutants of the v rel oncogene. *Journal of Virology* 67: 6876 6881

White DW, Roy A & Gilmore TD (1995) The v Rel oncoprotein blocks apoptosis and proteolysis of IκB-α in transformed chicken spleen cells. *Oncogene* 10: 857 868

References should be ordered alphabetically in the final Reference List. Journal name abbreviations may only be used if the Reference List is preceded by a list of these abbreviations along with the full name of each journal. If a given first author has multiple citations, these should be ordered chronologically in the list (starting with the earliest publication). If a given first author has multiple papers in a single year, they should be designated by “a” and “b” (e.g., Doe et al., 1988a; Doe et al., 1988b), etc.

All references included in the final Reference List must be cited at least once within the text of the dissertation, and all references cited within the text must be included in the final Reference List.

**ii. Citations within text should provide author(s) and date, and be provided in parenthesis.** If two authors, use Doe & Smith; if more than two authors, use Doe et al. If multiple citations are given, they are to be separated by semicolons, and ordered by year. That is, the above references would be cited in the text as (Pauling, 1960; Monod et al., 1962; Smith & Borgeat, 1985; Pirani et. al., 2004). If one discusses a specific study within the text, include only the year in parentheses; for example, “Monod et al. (1962) showed that...”

## GRS Ph.D. Graduation Deadlines (with Biology Program deadlines)

*All degree requirements are complete only when the doctoral dissertation has been certified as meeting the standards of the Graduate School of Arts and Sciences and of the Mugar Memorial Library*

GRADUATION DEADLINES FOR:	SEPTEMBER 25, 2017	JANUARY 25, 2018	MAY 18, 2018
Last date to hold Final Oral Exam (Defense)	August 11, 2017	December 8, 2017	April 6, 2018
Last date to submit dissertation to ETD	August 18, 2017	December 15, 2017	April 13, 2018
Last date to submit dissertation to ETD for graduation in the next semester without registering for that semester	September 6, 2017	January 18, 2018	May 14, 2018

9 - 12 months before proposed graduation date	<input type="checkbox"/> Dissertation Prospectus due to Graduate Program Specialist for departmental review
No later than 6 months before dissertation defense	<input type="checkbox"/> Dissertation Prospectus Approval Form due to GRS
Sep '17 diploma: 5/31/17 Jan '18 diploma: 9/30/17 May '18 diploma: 1/26/18	<input type="checkbox"/> Intent to Graduate Form Completed online
About 2 months before dissertation defense	<input type="checkbox"/> Meet with Graduate Program Specialist, DGS, and Faculty Advisor to review requirements for defense <input type="checkbox"/> Arrange for Special Service Appointments if committee members are not BU faculty <input type="checkbox"/> Send first draft of dissertation to readers
Once defense date is confirmed with committee	<input type="checkbox"/> Reserve room(s) for public seminar and defense
At least three weeks prior to dissertation defense	<input type="checkbox"/> Schedule of Final Oral Exam with Abstract Approval due to GRS <input type="checkbox"/> Properly formatted draft of dissertation submitted as .pdf to <a href="mailto:gsrec@bu.edu">gsrec@bu.edu</a>
At least two weeks prior to dissertation defense	<input type="checkbox"/> Send dissertation to all committee members
At least one week prior to dissertation defense	<input type="checkbox"/> Send booklet to Graduate Program Specialist
See above for final dates to submit dissertation to ETD	<input type="checkbox"/> Submit final dissertation to ETD (online submission) <input type="checkbox"/> Submit signature page to Graduate Program Specialist with original signatures from readers

## Program and Research Areas

The Department has three graduate program areas: Ecology, Behavior & Evolution (EBE, including Marine Biology); Neurobiology (Neuro); and Cell & Molecular Biology (CM). Each program area has unique strengths and suggested curricula. The department offers both Master's and Ph.D. degrees in Biology that emphasize independent research on the part of the student, and a non-research Master's degree. Many Biology faculty members participate in inter-departmental programs that offer graduate degrees. These affiliated programs include the following: Molecular Biology, Cell Biology & Biochemistry (MCBB); Graduate Program in Neuroscience (GPN); and Bioinformatics (BF).

Various Biology Department programs include faculty active in research in the areas listed below.

Behavioral ecology and sociobiology	Evolutionary Biology
Cancer biology	Genetics and genomics
Biochemistry	Marine biology
Biogeochemistry	Microbiology
Cell and molecular neurobiology	Molecular ecology and evolution
Cell signaling and gene regulation	Neural systems and behavior
Developmental biology	Neuroendocrinology
Ecology and conservation biology	Systems biology
Endocrinology and reproductive biology	Tropical ecology

### Cell & Molecular Biology (CM)

The Program in Cell & Molecular Biology offers courses and research opportunities in developmental biology, cell signaling, gene regulation, cancer biology, genetics, biochemistry, microbiology, physiology, systems biology, and membrane structure and function. Associated programs include the interdisciplinary program in Molecular Biology, Cell Biology & Biochemistry (MCBB), and the Bioinformatics program.

### Requirements for Cell & Molecular Biology (CM) Candidates in the PhD Program

#### Coursework

Molecular Biology I (BI 552)*	4 cr
Advanced Molecular Biology (BI 753)	4 cr
Graduate Biochemistry (MB 721)*	4 cr
Advanced Cell Biology (BI 735)	4 cr
Progress in CM Biology (BI 583/584)	2 cr/2 cr
Electives: 3 courses**	12 cr
Research courses	32 cr
<hr/>	
Total Credits	64 cr

\*students with strong molecular biology/biochemistry backgrounds can bypass this requirement (credit will still be needed from another elective course).

\*\*List of recommended elective courses on next page.

**List of Recommended Elective Courses**

Below is a list of recommended elective courses, although any Biology course can be taken as long as it is for graduate credit. One course among those denoted with a “◆” symbol can be taken by MA students to satisfy the cell biology requirement.

*Biochemistry and Molecular Biology*

BB 522 Molecular Biology Lab (4 cr) ◆

*Biology*

BI 527 Biochemistry I Laboratory (2 cr)

BI 528 Biochemistry II Laboratory (2 cr)

BI 545 Neurobiology of Motivated Behavior (4 cr)

BI 551 Biology of Stem Cells (4 cr) ◆

BI 553 Molecular Biology II (4 cr, for MA students) ◆

BI 560 Systems Biology (4 cr) ◆

BI 572 Advanced Genetics (4 cr) ◆

BI 576 Carcinogenesis (4 cr) ◆

BI 581/582 Seminar in Biology (various topics) (2 x 2 cr)

BI 594 Topics in Biology (various topics)

BI 610 Developmental Biology (4 cr) ◆

BI 645 Cellular and Molecular Neurophysiology (4 cr)

BI 655 Developmental Neurobiology (4 cr)

BI 681 Molecular Biology of the Neuron (4 cr) ◆

BI 753 Advanced Molecular Biology (4 cr.) ◆

*Chemistry*

CH 525 Physical Biochemistry (4 cr)

CH 541 Natural Products Chemistry (4 cr)

CH 612 Separation Methods in Chemistry and Biochemistry (4 cr)

CH 721 Enzyme Kinetics and Mechanisms (4 cr)

CH 722 Protein Chemistry (4 cr)

*Engineering*

BF 527 Applications in Bioinformatics (4 cr)

BE 561 DNA and Protein Sequence Analysis (4 cr)

BE 700 Advanced Topics in Biomedical Engineering (var cr)

BF 768 Biological Database Analysis (4 cr)

*Molecular Biology, Cell Biology and Biochemistry (MCBB)*

MB 722 Advanced Biochemistry (4 cr)

*School of Public Health*

SPH BS 704 Introduction to Biostatistics (3 cr)

All Biochemistry and Molecular Biology, Biology, Chemistry, and MCBB course descriptions may be found in the graduate bulletin available on the Graduate School of Arts & Sciences website at <http://www.bu.edu/academics/grs/courses>. Engineering course descriptions can be found at <http://www.bu.edu/bme/graduate/courses/>

## Grant Writing Seminar

In the first semester of the first year, students take a grant writing seminar course (BI581, 2 credits) that counts towards elective credit. For that course, students are expected to write an NSF GRFP proposal, which is usually submitted for a deadline in mid-October to early November. Students write this proposal in consultation with the course instructor and their first rotation advisor.

## Seminar

Students participate in the CM seminar program that consists of two required weekly seminars, and a number of optional lectures and colloquia. These include BI583/584, described above (meets at ~noon on Fridays) and the Biology Departmental Seminar Series (meets at ~noon on Mondays).

## Lab Rotations

Students are required to perform three laboratory rotations with Biology faculty during their first academic year (6-8 weeks each).

## Examinations/Defenses

**a. Preliminary Exam:** In January of the second year, a preliminary exam is administered. This exam must be passed prior to the qualifying examination. The exam covers topics related to Cell Biology, Molecular Biology, and Biochemistry that should have been mastered by students through the required coursework. If any topic is not passed satisfactorily, the student has a second chance to take the exam (usually in June). A student has two chances to pass this exam. If a student fails to pass on their second attempt, the preliminary exam committee, the major professor, and the Department Chair determine whether the performance on the exam(s) and/or any additional work is sufficient to confer the M.A. degree.

**b. Qualifying Exam:** The qualifying examination consists of two parts: one, a written research proposal; and two, the oral defense of this research proposal. The qualifying exam should be taken within nine months of passing the preliminary exam.

- **Written Proposal:** The student in consultation with the major professor and other parties submits a WRITTEN proposal of the intended dissertation research. The academic code of conduct applies, and the written document should be from the student's own hand, not just cutting and pasting old grant proposals, papers, etc. The major professor and the examination committee may have input in the form of suggestions on content and organization, but should not directly edit the document. This proposal should include an extensive introduction complete with appropriately cited literature, a list of specific aims, and a description of the intended experiments. The proposal should be approximately 15-20 pages long, double-spaced. **The written proposal must be submitted to and approved by the Chair of the qualifying examination committee at least two weeks prior to the scheduled examination.**
- **Oral Exam:** At this examination, the student gives an oral presentation of the proposal. The committee poses questions related to the intended research, background information, and the field of the work. The committee may also question areas perceived as the student's weaknesses during the preliminary exam, but only as they pertain to the research proposal. The committee chair ensures that the questions are

appropriate (e.g. not too far afield) and that each committee member has a more-or-less equal opportunity to question the student.

While this proposal and oral defense is normally on the research that the student has proposed to carry out, it is not a thesis defense. There is no requirement for preliminary data and the eventual dissertation work may change considerably over time.

- **Advancing to Candidacy:** The student's Qualifying Examination Committee is responsible for grading the exam. More than one failing vote, or a failing vote by the major professor, on the qualifying examination constitutes a failure. Any student failing the Qualifying Exam has the opportunity to take it again, but at least three months must elapse before a student is allowed to retake the exam. Failure of the second examination is grounds for automatic dismissal from the Ph.D. program and the loss of further financial aid from the Biology Department, although the student may still be eligible for the M.A. degree provided that those degree requirements are met. If at least four members of the Qualifying Examination Committee, including at least three CM faculty, vote that the student's performance on the examination was at a level appropriate for an M.A. degree, the degree is given. In addition, this student must have completed at least 32 credits of graduate level course work.

**c. Dissertation Defense:** After advancing to candidacy for the Ph.D., the student and the major professor must jointly convene a Dissertation Committee, which meets at least once a year. Ph.D. students should present either a written or oral report on research progress to the thesis committee. The committee meeting date and synopsis must be included on the annual report. The Dissertation Committee consists of no less than five faculty members, at least three of whom must be members of the CM faculty. The Dissertation Committee shall consist of a Chair, a First Reader (the major advisor in CM-Biology), a Second Reader, and at least two other members (a third reader is optional). The dissertation is "defended" at the Final Dissertation Committee meeting at a time agreed on by the student and the Dissertation Committee. At least two weeks prior to the defense, all work that comprises the dissertation and the written dissertation, which meets the specification, described above and has been approved by all readers, must be distributed to the committee. At the Final Dissertation Committee meeting the committee agrees on the adequacy of the body of work and written thesis for the Ph.D. degree. Finally, there is a required public seminar, which is normally given before the defense.

## Requirements for Cell & Molecular Biology (CM) M.A. Students

### Coursework

Molecular Biology I (BI 552) <i>or</i> Advanced Molecular Biology (BI 753)	4 cr
Biochemistry I (BI 621)	4 cr
One cell biology course**	4 cr
Electives: 5 courses**	20 cr
<hr/>	
Total Credits	32 cr

\*\*See list of elective courses on page 20 (except BI 527), under Ph.D. requirements. Those denoted by “◆” in the list are acceptable for cell biology course. For those doing a research master’s, 12 credits of electives can come from “research (900-level)” courses.

### Seminar

M.A. students are not required to participate in the CM seminar program, but they are encouraged to attend both of the following required weekly seminars for the Ph.D. students:

- Mondays at approximately 12:00pm, Biology Departmental Seminar Series (Outside speakers for Biology and MCBB).
- Fridays at 12:00pm, CM/MCBB Student Seminar Series.

## **Ecology, Behavior, and Evolution Program (EBE)** ***(Includes the Marine Program)***

The Program in Ecology, Behavior & Evolution (EBE) includes courses and research opportunities in behavioral ecology and sociobiology, molecular ecology and evolutionary biology, population ecology, community ecology, ecosystem ecology and biogeochemistry. A broad perspective is emphasized, from molecular, organismal, population, community and ecosystem levels of biological organization.

### **Requirements for the Ecology, Behavior and Evolution Candidates in the Ph.D. Program**

The goal of the Ph.D. program in EBE is to produce comprehensively trained professionals who excel in their individual research and possess a deep and broad understanding of Ecology, Behavior and Evolution. Each person's ability, preparation, and needs will vary; however, a guide to critical steps in the student's graduate career is useful for both the student and his/her advisor(s). The following guidelines have been developed as an aid to planning a student's graduate career. Because the department guarantees financial support for five years only, students are encouraged to be cognizant of time and work efficiently.

#### **Grant writing seminar**

In the first semester of the first year, students take a grant writing seminar course (BI671 or BI581, 2 credits) that counts towards elective credit. Students will be expected to write an NSF GRFP proposal, to be submitted in early November, or another proposal appropriate to their funding eligibility. Students write this proposal in consultation with their advisor.

#### **Research Seminars**

Students participate in the EBE seminar program that consists of two required weekly seminars. These include BI579/580, the EBE Chalk Talk series (meets at 12 noon on Wednesdays) and the Biology Departmental Seminar Series (meets at 12 noon on Mondays).

#### **Committees**

Each student is responsible for organizing **annual** meetings with the committee that will advise and oversee his/her Ph.D. program. The annual meeting with the committee is critically important. During these meetings the student will receive advice and guidance in his/her professional development and will have the undivided attention of several faculty members simultaneously.

Three committees must be established. The student's research advisor will serve on each committee but the composition of the committees may vary (although it is recommended that students maintain the composition of their committees as much as possible). In chronological order, the first is the Advisory Committee, the second is the Preliminary & Qualifying Exam Committee, and the third is the Dissertation Committee. The Advisory Committee will help the student develop a plan for coursework and research in the first year. The Preliminary & Qualifying Exam Committee will help the student prepare for the preliminary and qualifying exams and will administer the exams in the student's fourth semester. The student must pass these exams

to advance to candidacy for the Ph.D. degree (see The Preliminary and Qualifying Exams and Advancing to Candidacy). It is recommended that the student organize his/her Preliminary & Qualifying Exam Committee as early as possible (most students do it at the beginning of their third semester) and arrange to take courses or directed readings with the faculty members. Finally, the Dissertation Committee is the group ultimately responsible for overseeing the student's dissertation research. The Dissertation Committee will advise the student during the course of his/her research and it is important that the student keep them informed of research progress and plans through annual committee meetings.

*NOTE: Faculty members are often under severe time constraints so students should organize their committees and meetings well in advance of the dates for the qualifying exam, thesis defense, etc.*

### **EBE Ph.D. Program**

The following is an example of how a student might organize his/her graduate studies. The nature and schedule of research in different EBE labs varies, and students should consult closely with their advisors to develop an appropriate individualized plan for their progression through the PhD.

#### **Year 1**

- Semester 1: Student, in consultation with advisor, develops a plan of coursework and research.
  
- Semester 2: Coursework, independent reading, regular consultation with advisor, and initial pilot research or planning for a field season as necessary to prepare the student for the first summer of research.
  
- Summer I: Student begins dissertation research. Often this is a pilot study to determine the feasibility of a project or to identify potential projects. Research plans often change and therefore it is a good idea to meet with the Advisory Committee early in the following semester.

#### **Year 2**

- Semester 3: Student forms Preliminary and Qualifying Exam Committee and meets with committee members (individually or collectively) to discuss preparation for and scheduling of these exams. Preparation may include coursework, directed readings, or other requirements with the explicit aim of developing the student's breadth and depth of knowledge in Ecology, Behavior, & Evolution.
  
- Semester 4: Student takes Preliminary and Qualifying Exams. The student is responsible for organizing the time for the Preliminary and Qualifying Exams and should make arrangements early in the semester (or in Semester 3, for the Preliminary Exam) to avoid problems with committee members' schedules. The Preliminary and Qualifying Exams should be taken by the end of semester 4 and must be taken before the start of semester 5. The exam will consist of a written examination on questions composed by the committee, followed by an oral examination with the committee members (see below).

For students in EBE, the exams are designed to test the student's breadth and depth of knowledge in areas of Ecology, Behavior, and Evolution (and possibly other branches of biology or additional disciplines relevant to the student's research interests). It is strongly recommended that students take courses in each of these areas prior to the exam and/or organize directed readings with committee members well in advance of the Preliminary and Qualifying Exams (see below).

**Summer II:** Student pursues research with the explicit aim of demonstrating the feasibility and importance of the project. It is useful for the student to view their research during this summer as an opportunity to gather sufficient preliminary data for an NSF dissertation improvement grant.

**Year 3** The student should have a clear plan for a feasible dissertation project and sufficient data to apply for independent research funding.

The student should present their research to the department in a seminar that includes the conceptual background, rationale, methodology, preliminary results and plans for their dissertation work. The seminar course BI579 Progress in EBE & Marine Biology is a weekly venue for all current EBE/MB graduate students to present their research to their peers once per year. All students are expected to present once per academic year and all students are required to register for the course at least once.

The student should present their research progress and plans to their Dissertation Committee in their annual committee meeting, for discussion and approval. Students should provide their committee with a written synopsis of their research progress and dissertation plans in advance of the meeting to facilitate feedback. Scheduling a committee meeting to immediately follow a seminar is efficient, but students may present their research during the committee meeting if necessitated by scheduling constraints.

Students should apply for grants that provide independent support for their research, as appropriate to their research field. DDIG proposals are due the second Thursday of October. Students should plan well in advance to receive feedback on proposal drafts from their advisor and committee members.

**Years 4 & 5** It is expected that students will pursue a fruitful line of research and will publish in a timely fashion. We especially encourage students to develop scholarly publications prior to completion of their dissertation. It is expected that the student will file and defend the Ph.D. dissertation by the end of the fifth year. Students should arrange the time for their dissertation defense and should submit the dissertation to committee members well in advance of the defense (two weeks or more prior to the defense).

### **For Current Students Beyond Their First Year in the Ph.D. program**

Students beginning their second year should establish their Qualifying Exam Committee, meet with their committee members early in the academic year, and prepare for Qualifying Exams in the spring semester. We expect that by the end of the academic year all second year students will have passed the Qualifying Exams and be on track with the schedule outlined above.

Third year students, if they have not already done so, should establish their Dissertation Committee immediately, develop and distribute their dissertation prospectus, and schedule a seminar and committee meeting to present and discuss the prospectus. All third year students should have passed their Qualifying Exam and presented their dissertation prospectus by the end of the Fall semester. We also encourage third year students to actively pursue grant funding for their dissertation work.

Students who are beyond the third year should already be well on track to complete their dissertation by the end of the fifth year. If they have not done so they should submit a dissertation prospectus to their committee members for feedback.

## The Preliminary Exam, Qualifying Exam and Advancing to Candidacy

**Part 1: Preliminary Exam (2-day, 4 hours on each day, closed book):** The exam will be comprised of individual questions compiled by the committee chair (who is not the major professor), and drawn from at least two of the following areas: ecology, behavior, and evolutionary biology (broadly defined). These areas will be decided beforehand by the committee and student. Four questions will be provided at the beginning of each four hour session.

Students will have to pass the preliminary exam to continue in the Ph.D. program. Failure to provide satisfactory answers to individual questions may be grounds for a conditional pass. Under these circumstances, students would be given a week to do additional literature research on the topic and provide a revised answer along with requisite bibliographic support. If deemed acceptable by the committee, no further action by the student would be required. Once the student officially passes the Preliminary Exam, the Chair of the committee should tell the Graduate Program Specialist in the Department of Biology so a note can be made in the student's file.

Failure to provide satisfactory answers on either of the two sections of the exam would be considered a failing score. Students failing the first attempt at the preliminary exam would be allowed to take it a second time no sooner than 3 months after the first exam date. If a student fails to pass on their second attempt, the preliminary exam committee, the major professor, and the Department Chair will determine if the performance on the exam(s) and/or any additional work is sufficient to confer the M.A. degree.

**Part 2: Qualifying Exam (2 Steps; must be completed within 9 months of passing Preliminary Exam):**

**Step 1: Written research proposal** (8 pages single spaced, maximum)

The student, in consultation with the major professor and other committee members, submits a written proposal of the intended dissertation research one week before the oral exam.

**Step 2: Oral exam** (2-3 hours)

One faculty member is assigned as Chair in advance and the Chair is given a copy of the proposal two weeks ahead of the scheduled oral exam. The Chair reviews the proposal to make sure it is acceptable to go forward. The student then revises it if necessary and distributes it to the rest of the committee. If the document is assessed by the Chair as not ready to be shared with the committee following revision, the oral exam is rescheduled.

For the oral exam, the student gives a 15 minute oral presentation of the proposal. The committee poses questions related to the intended research, background information, and broad field of the work. The committee may also question areas perceived as the student's weaknesses during the preliminary exam, as they pertain to the research proposal.

**Advancing to Candidacy:** The student's Qualifying Exam Committee is responsible for grading the exam. Any student failing this examination has the opportunity to take the exam again; at least three months must elapse before a student is allowed to retake the exam. Failure of the second exam is grounds for automatic dismissal from the Ph.D. program and the loss of any further financial aid, although the student may still be eligible for the M.A. degree provided that those degree requirements are met (see Option Two under Master of Arts for Ph.D. students). If at least three members of the Qualifying Exam Committee, including at least two EBE faculty members, vote that the student's performance on the examination was at a level appropriate for an M.A. degree, and the student has completed at least 32 credits of graduate level course work, the M.A. degree is awarded.

## Requirements for EBE M.A. Students

### Coursework

Students, in consultation with advisors, develop a plan of coursework and research. Students are required to take a minimum of 20 credits of coursework. 12 credits can come from “research (900-level)” courses. MA students in EBE are required to take BI 671 in their first year and BI 579/580 throughout their time at Boston University. They should enroll officially in BI 579/580 in the year that they give an oral presentation (likely in their second year).

#### *Anthropology*

- AN 552 Primate Evolution & Anatomy (4 cr)
- AN 595 Methods in Biological Anthro. (4 cr)
- AN 597/598 Topics in Biological Anthro. (4 cr)
- AN 735 The Ape Within (4 cr)
- AN 736 Primate Evolutionary Ecology (4 cr)

#### *Biology*

- BI 504 Advanced Evolutionary Analysis (4 cr)
- BI 506 Phenotypic Plasticity (4 cr)
- BI 519 Theoretical Evolutionary Ecology (4 cr)
- BI 530 Forest Ecology (4 cr)
- BI 542 Neuroethology (4 cr)
- BI 543 Global Ecology (4 cr)
- BI 563 Sensory Biology of Aquatic Animals (4 cr)
- BI 581 Seminar in Biology (2 cr)
- BI 607 Animal Behavior (4 cr)
- BI 610 Developmental Biology (4 cr)
- BI 611 Microbiome (4 cr)
- BI 614 Ornithology (4 cr)
- BI 623 Marine Biogeochemistry (4 cr)
- BI 643 Terrestrial Biogeochemistry (4 cr)
- BI 648 Biodiversity & Conservation Bio (4 cr)
- BI 675 Urban Ecology (4 cr)
- BI 719 Colloq. Terrestrial Biogeoscience (2 cr)
- BI 720 Pract. Terrestrial Biogeoscience (2 cr)

#### *BUMP Semester*

- BI 523 Marine Urban Ecology (4 cr)
- BI 531 Ichthyology: BUMP (4 cr)
- BI 539 Coral Reef Dynamics: BUMP (4 cr)
- BI 541 Coral Reef Resilience & Restoration (4 cr)
- BI 546 Marine Megafaunal Ecology (4 cr)
- BI 550 Marine Genomics (4 cr)
- BI 569 Tropical Marine Invertebrates (4 cr)
- BI 578 Marine GIScience (4 cr)
- BI 591 Bio-Optical Oceanography (4 cr)
- BI 593 Marine Physiology & Climate Change (4 cr)
- ES 543 Estuaries & Nearshore Systems (4 cr)

#### *Earth & Environment*

- ES/GE 507 Dynamical Oceanography (4 cr)
- GE 516 Multivariate Stats for Geographers (4 cr)
- GE 525 Plant Physiological Ecology (4 cr)
- GE 529 Modeling & Monitoring Terr. Ecosys. (4 cr)
- GE 656 Terr. Ecosys. & the Carbon Cycle (4 cr)
- GE 675 Urban Ecology (4 cr)

#### *Public Health*

- SPH BS 704 Intro to Biostatistics (3 cr)

## List of Recommended Elective Courses

Below is a list of recommended elective courses for M.A. and Ph.D. EBE/Marine students.

### Neurobiology Program

The Program in Neurobiology offers courses and research opportunities in areas of contemporary neurobiology, including: neurotransmission and synaptic plasticity, molecular neurobiology, neural development, network-level analyses of sensory and sensorimotor systems, and neural circuits underlying natural behaviors. The organisms under investigation include crayfish, lobster, zebra finch, rat, and mouse. Biology faculty members also participate in the interdepartmental Ph.D. Graduate Program in Neuroscience (GPN).

### Requirements for Neurobiology (Neuro) Candidates in the Ph.D. Program

#### Coursework

Cellular and Systems Neuroscience (BI 755)	4 cr
Neural Systems (BI 741) [or BI 756]	4 cr
Graduate Seminar Series in Neuroscience (NE 500/NE 501)	2 cr/2 cr
Electives: 5 courses**	20 cr
Research courses	32 cr
<hr/>	
Total Credits	64 cr

*\*\*The elective courses should be chosen in consultation with the faculty advisor (see page 31). It is STRONGLY recommended that at least one of the elective courses be a relevant graduate laboratory course.*

#### Seminar

Students must participate in the weekly Neuro seminar program (NE 500) that meets at 9:30 AM on Fridays, and a number of optional lectures and colloquia. They are not required to attend the journal club associated with NE500/501.

#### Lab Rotations

Students are required to perform at least two laboratory rotations with Neurobiology faculty during their first academic year (6-8 weeks each).

#### Examinations/Defenses

**Qualifying Examinations:** Students beginning their second year should establish their Qualifying Exam Committee, meet with their committee members early in the academic year, and prepare for their Qualifying Exam. We expect that by the end of the second academic year all students will have passed their Qualifying Exam. The qualifying examination must be passed for the Ph.D. degree. Once the student has passed this exam, she/he is formally a candidate for the Ph.D. in the NEURO program. The qualifying examination consists of two parts; one, a written research proposal and two, the oral defense of this research proposal.

1. Written Proposal: The student, in consultation with the research advisor and other

parties, submits a WRITTEN proposal of the intended dissertation research. The academic code of conduct applies, and the written document should be from the student's own hand, not just cutting and pasting old grant proposals, papers, etc. The major professor may have input in the form of suggestions on content and organization, but should not directly edit the document. This proposal should be written in the form of an NRSA F31 NIH grant proposal, and it should include a list of specific aims, an extensive introduction and an outline of the intended experiments with necessary preliminary data, complete with appropriately cited literature. The proposal should be approximately 10-15 double-spaced pages long. The written proposal must be given to and approved by the qualifying examination committee at least two weeks prior to the scheduled examination.

2. **Oral Exam:** At the examination, the student gives an oral presentation of the proposal, including preliminary results. The committee then poses questions related to the intended research, background information, and the field of the work. The committee chair ensures that the questions are and that each committee member has a more-or-less equal opportunity to question the student.

While this proposal and oral defense is normally on research the student plans to carry out, it is not a thesis defense. Thus, the eventual dissertation work may change considerably over time.

**Advancing to Candidacy:** The student's Qualifying Examination Committee is responsible for grading the exam. More than one failing vote, or a failing vote by the major professor, on the qualifying examination constitutes a failure. Any student failing the Qualifying Exam has the opportunity to take it again, but at least three months must elapse before a student is allowed to retake the exam. Failure of the second examination is grounds for automatic dismissal from the Ph.D. program and the loss of further financial aid from the Biology Department, although the student may still be eligible for the M.A. degree provided that those degree requirements are met. If at least four members of the Qualifying Examination Committee, including at least three Neurobiology faculty, vote that the student's performance on the examination was at a level appropriate for an M.A. degree, the degree is given. In addition, this student must have completed at least 32 credits of graduate level course work.

**Dissertation Defense:** After advancing to candidacy for the Ph.D., the student and major professor must jointly convene a Dissertation Committee, which meets at least once a year. Ph.D. students should present either an oral report on research progress to the thesis committee. The committee meeting date and synopsis must be included on the annual report. The Dissertation Committee consists of no less than five faculty members, at least three of whom must be members of the Neurobiology faculty. The Dissertation Committee shall consist of a Chair, a First Reader (the major advisor in Neurobiology), a Second Reader, and at least two other members (a third reader is optional). The dissertation is "defended" at the Final Dissertation Committee meeting at a time agreed on by the student and the Dissertation Committee. At least two weeks prior to the defense, all work that comprises the dissertation and the written dissertation, which meets the specification, described above and has been approved by all readers, must be distributed to the committee. At the Final Dissertation Committee meeting the committee agrees on the adequacy of the body of work and written thesis for the Ph.D. degree. Finally, there is a required public seminar, which is

normally given before the defense.

## Requirements for Neurobiology (Neuro) M.A. Students

### Coursework

Cellular and Systems Neuroscience (BI 755)	4 cr
Neural Systems (BI 741) [or BI 756]	4 cr
Graduate Seminar Series in Neuroscience (NE 500/NE 501)	2 cr/ 2 cr
Electives: 5 courses**	20 cr
<b>Total Credits</b>	<b>32 cr</b>

\*\*The elective courses should be chosen in consultation with the faculty advisor. It is STRONGLY recommended that at least one of the elective courses be a relevant graduate laboratory course. For those doing a research master's, 12 credits can come from research courses.

### List of Recommended Elective Courses

Below is a list of recommended elective courses for MA and PhD neurobiology students.

- BI 520 Sensory Biology (4 cr)
- BI 525 Biology of Neurodegeneration (4 cr)
- BI 535 Translational Research in Alzheimer's Disease (4 cr)
- BI 542 Neuroethology (4 cr)
- BI 545 Neurobiology of Motivated Behavior (4 cr)
- BI 581 Seminar in Biology: Neurobiology of Brain Disorders (2 cr)
- BI 598 Neurobiology of Neural Circuits (4 cr)
- BI 599 Synapse (4 cr)
- BI 645 Neurophysiology (4 cr)
- BI 649 Neuro Design Lab (4 cr)
- BI 655 Developmental Neurobiology (4 cr)
- BI 681 Molecular Biology of the Neuron (4 cr)
- BI 741 Neural Systems (4 cr)
- BI 755 Cellular and Systems Neuroscience (4 cr)
- BI 756 Systems and Behavioral Neuroscience (4 cr)

*All course descriptions may be found in the graduate bulletin available on the Graduate School of Arts & Sciences website at <http://www.bu.edu/academics/grs/courses>.*

## Biology and Related Courses Approved for Graduate Study in the Department of Biology

<b>Course</b>	<b>Title</b>	<b>Course</b>	<b>Title</b>
CAS BB 522	Molecular Biology Laboratory	CAS BI 581/582	Seminar in Biology
CAS BI 504	Advanced Evolutionary Analysis	CAS BI 583/584	Progress in Cell & Molecular Biology
CAS BI 506	Phenotypic Plasticity	CAS BI 591	Bio-Optical Oceanography
CAS BI 513	Genetics Laboratory	CAS BI 593	Marine Physiology and Climate Change
CAS BI 515	Population Genetics	CAS BI 594	Topics in Biology
CAS BI 519	Theoretical Evolutionary Ecology	CAS BI 598	Neural Circuits
CAS BI 520	Sensory Neurobiology	CAS BI 599	Physiology of the Synapse
CAS BI/GE 523	Marine Urban Ecology	GRS BI 607	Animal Behavior
CAS BI 525	Biology of Neurodegenerative Diseases	GRS BI 610	Developmental Biology
CAS BI 527	Biochemistry Lab I	GRS BI 611	Microbiome
CAS BI 528	Biochemistry Lab II	GRS BI 614	Ornithology
CAS BI 530	Forest Ecology	GRS BI 661	Herpetology
CAS BI 531	Ichthyology	GRS BI 621/622	Biochemistry I & II
CAS BI 535	Translational Research in Alzheimer's Disease	GRS BI 623	Marine Biogeochemistry
CAS BI/ES 539	Coral Reef Dynamics	GRS BI 643	Terrestrial Biogeochemistry
CAS BI 541	Coral Reef Resilience and Restoration	GRS BI 645	Cellular and Molecular Neurophysiology
CAS BI 542	Neuroethology	GRS BI 648	Biodiversity and Conservation Biology
CAS BI 543	Global Ecology	GRS BI 655	Developmental Neurobiology
CAS BI 545	Neurobiology of Motivated Behavior	GRS BI 671	Survey of EBE and Marine Biology
CAS BI 546	Marine Megafaunal Ecology	GRS BI 675	Urban Ecology
CAS BI 550	Marine Genomics	GRS BI 681	Molecular Biology of the Neuron
CAS BI 551	Biology of Stem Cells	GRS BI 701/702	Graduate Readings in Biology (MA)
CAS BI 552	Molecular Biology I	GRS BI 719	Colloquium in Terrestrial Biogeoscience
CAS BI 553	Molecular Biology II	GRS BI 720	Practicum in Terrestrial Biogeoscience
CAS BI 560	Systems Biology	GRS BI 735	Advanced Cell Biology
CAS BI 563	Sensory Biology of Aquatic Animals	GRS BI 741	Neural Systems
CAS BI 569	Tropical Marine Invertebrates	GRS BI 753	Advanced Molecular Biology
CAS BI 572	Advanced Genetics	GRS BI 755	Cellular and Systems Neuroscience
CAS BI 576	Carcinogenesis	GRS BI 756	Systems and Behavioral Neuroscience
CAS BI 578	Marine Geographic Information Science	GRS MB 721	Graduate Biochemistry
CAS BI 579/580	Progress in EBE and Marine Biology I	GRS MB 722	Advanced Biochemistry
		GRS NE 500/501	Graduate Seminar Series in Neuroscience

## Financial Assistance

The GRS policy is that financial aid awarded by Boston University may be used only for courses required by the degree program. It may be used for courses taken as co-requisites or prerequisites by special permission from the Graduate School of Arts & Sciences. It may not be used for the Sports Pass, subway/bus passes, library fines or late fees. For Ph.D. students, tuition for an audited course will be covered by scholarship if the course is approved by the Director of Graduate Studies. This course must be related to the dissertation research, or be considered as background or preparation for the dissertation research or topic. 900-level courses may not be audited. Financial Aid may not exceed the cost of required tuition, fees and living expenses.

**Direct Deposit:** All students are encouraged to set up Direct Deposit by going to the Student Link under the Work tab. Students who have not set up Direct Deposit before the first payroll run in mid-September will have to pick up their stipend checks at the Student Payroll Office, 881 Commonwealth Ave, 2nd Floor.

### M.A. Students

Master's students are expected to pay their own tuition. On occasion when teaching positions for the Department of Biology are available, Master's students may apply within the department for a Teaching Assistantship (TA). These positions consist of a 20-hour per week commitment on average and provides \$6,000 per semester paid on a weekly basis. Students involved in active research should speak to their advisor before accepting a TA position. If interested in potential TA opportunities, please send your CV – including courses taken – to the Biology Graduate Program Specialist.

In addition to potential TA positions, the following options may help assist Master's students in financing their graduate education:

- The Student Employment Office
- Federal Work Study
- Federal Stafford Loans
- Credit Based Loans (Federal PLUS & Private)

Please contact [grsaid@bu.edu](mailto:grsaid@bu.edu) for questions about financial aid options for Master's students.

### Ph.D. Students

Ph.D. students in the CM and Neuro programs are guaranteed 12 months a year of stipend support and tuition for 5 years provided they make satisfactory progress towards their degree and remain in good academic standing. EBE and Marine Biology students are guaranteed tuition and 10 months per year of stipend support provided they remain in good academic standing and make satisfactory progress towards their degree. Most EBE and Marine Biology students are supported 12 months of the year. In an extremely rare case, a student failing to meet these requirements and at risk of losing funding will be notified well in advance.

Ph.D. students are encouraged to apply for fellowships and grants at funding agencies. All domestic first-year students apply for NSF Graduate Research Fellowships in the Fall semester.

**Dean's Fellowships:** These are non-service fellowships allocated to first-year Ph.D. students that do not have immediate teaching requirements. These are paid monthly on the 4th Friday of the month. Domestic students on non-service fellowships will not have taxes withheld by the University; however, students are still required to report their stipend to the IRS and pay taxes, if applicable. International students will be taxed at a rate of 14% unless their government has a tax treaty with the U.S. For more information on tax exemption for international students, refer to the Student Employment Office website: <http://www.bu.edu/seo/students/taxes/taxes-international/>

**Teaching Fellowships (TF):** These provide a stipend plus full tuition and fees for up to four full courses per semester plus a 2-credit teaching course. Teaching responsibilities usually require approximately 20 hours per week. Full or partial awards may be given.

**Doctoral Research Fellowships (RF):** These awards are given to students who assist individual faculty with specific areas of research and the stipend amount is funded by faculty research grants. There are a substantial number of graduate student research positions in Biology, which are funded through faculty research grants. These Research Fellowships provide the stipend and full tuition. The supervising faculty member determines the specific duties of the Research Fellow. Consult your faculty advisor.

**Biology Department Awards:** Several competitive awards are available to graduate students in the Department of Biology. These include:

- *The Thomas H. Kunz Award* - summer stipend support for EBE Ph.D. candidates who have completed the qualifying exam, with a preference for those conducting field research in the award year.
- *The Charles Terner Award* - summer stipend support for CM or MCBB Ph.D. candidates who have completed the qualifying exam and who have made significant contributions to their field.
- *The Brenton R. Lutz Award* - summer stipend support for Neurobiology or GPN Ph.D. candidates who have who have completed the qualifying exam and made significant contributions to their field.
- *Dr. Marion R. Kramer Scholarship* - summer stipend support for female Biology Ph.D. candidates who are committed to excellence in scientific research.
- *The I. Alden Macchi Award* - support to be used to attend a conference for Biology Ph.D. candidates who have completed the qualifying exam in the fields of endocrinology and/or regulatory biology.
- *Warren McLeod Fellowships* – provides either a summer stipend support or a single year of support for Ph.D. candidates who have completed the qualifying exam and are conducting research in marine science.
- *Dana Wright Fellowship* – provides support for M.A. and Ph.D. students in Marine Biology. It may be used for stipend support (up to 4 months), research supplies, and/or travel expenses related to research.

**Training Grants:** Opportunities for support through this avenue exist. Consult your faculty advisor.

**Work Study Aid:** All eligible graduate students can apply for summer and academic year awards. Applications can be obtained from the Graduate School. Students receiving work-study aid will be expected to provide service to the Department (teaching) or in the laboratory of their major professor (research). Master's candidates are eligible for federal work-study funding.

**National Science Foundation (NSF) Graduate Fellowships:** Graduate students in either their first- or second-year are encouraged to apply for these prestigious three-year fellowships. NSF Fellowship applications are due in November of each year. For applications and instructions go to: [http://www.nsf.gov/funding/education.jsp?fund\\_type=2](http://www.nsf.gov/funding/education.jsp?fund_type=2)

**Department Graduate Travel Grants:** Travel Grants may be available to assist students in their travel to professional scientific meetings. Students presenting papers or posters on their research will receive first consideration. Further questions should be directed to the Graduate Committee.

**Other sources:** Students should see their faculty advisors for other potential sources of financial support, or check the small reference library at the Associate Dean's Office, Graduate School, Room 115.

## General Information for Charles River Campus Buildings

### Building Hours & Department Facilities

Main doors to 2, 5, Cummington Mall and 590 Commonwealth Avenue will generally be unlocked from 7:30 AM to 10:00 PM, Monday through Friday. Admittance is possible 24 hours a day (including weekends). For after hour access, contact Maddy Davis or Jennifer Scott in BRB 101. Main doors to 24 Cummington Mall will be unlocked from 7:30 AM to 9 PM, Monday through Friday. After hour access at 24 Cummington Mall is coordinated by Peter Castellano in LSE 602.

At 5 Cummington Mall, your office key will open most common spaces. At 2, 5 and 24 Cummington Mall, as well as 590 Commonwealth Avenue, there is a swipe card reader to open the front door after hours. All keys for BSC, BRB, and SCI are distributed by Front Desk Staff in BRB 101. You will need to complete and return a "Key Request Form" with your advisor's signature, as well as \$5.00 deposit. Check the number on the door locks/cores. All keys for LSE are distributed by Peter Castellano in LSE 602 or Tom Symancyk in LSE 107.

All persons using departmental facilities must arrange for their use through the staff or faculty member responsible for the facility. Persons using the facility must be checked out before use by the responsible staff member and must familiarize themselves with the regulations governing its use and maintenance.

### Emergencies

In case of emergencies at 2 Cummington Mall building services (heat, electricity, water, refrigeration, air-conditioning, etc.), call Tom Symancyk, Materials Manager, at x3-2467. If Tom is unavailable call the building supervisor Dennis Batista 358-4282. If Dennis is not available, call the Buildings & Grounds Emergency number 353-2105. In case of emergencies at 5 and 24 Cummington Mall, contact Dennis Batista 358-4282. If Dennis is not available, contact Peter Castellano 353-8736.

In case of emergencies posing threat to health or safety (chemical spills, etc.), contact Director of Environmental Health and Safety, at 353-9734, or for immediate assistance, contact Campus Police at 353-2121.

In case of a medical emergency, Student Health Services and/or the University Police will help in managing the emergency quickly and effectively. Call the Boston University Police at 617-353-2121 (3-2121 on a campus phone) or 911 if you have a life-threatening emergency. True medical emergencies are transported by ambulance to local hospital emergency departments. Boston University Student Health Services will call to follow up on your emergency and will help in arranging additional care when needed. Later you should contact Sara Martin in the Biology Office to file the required Accident Report Form.

- Emergency: 617-353-2121 BU Police, 911 if life-threatening
- Student Health Services 617-353-3575
- Sexual Assault 617-353-SARP (7277)
- Behavioral Medicine 617-353-3569
- Poison Control Center 617-232-2120
- Boston Area Rape Crisis Center 617-492-RAPE (1-800-841-8371)

Visit <http://www.bu.edu/ehs/comm/> for more detailed information regarding emergencies.

## **BU Alert**

BU Alert is an emergency notification system that will help ensure rapid and reliable mass communication to students, faculty, and staff. The BU Alert system is designed to communicate with cell phones (text and voice messages), landlines, e-mail systems, and pagers during a crisis or time-sensitive situation on the Boston University Charles River and Medical campuses. Students are required to provide an emergency number as part of their registration and can update their contact preferences on the Student Link. Questions concerning enrollment in the BU Alert program may be addressed to the Admissions Office (617-353-2300).

## **Department Administrative Support Policies**

### **Mail**

Graduate student mailboxes are located in the corridor outside BRB 101. They are set up alphabetically. The combinations and box number assignments can be obtained from Front Desk Staff in BRB 101. The Boston University Postal Service picks up federal and interdepartmental mail from the mailroom once a day. The BU Postal Service sorts this mail into interdepartmental and U.S. Mail, so please make sure that interdepartmental mail is in manila envelopes and clearly marked. If you must use a white envelope for interdepartmental mail it should be clearly marked or it will be sorted into the US Mail and charged back to the Department. It will also take a long time for this mail to arrive at its destination as it will be sent outside the University and then returned to go once again through the BU Postal Service. This is intended for Department and University business and not for personal mail. Any personal mail must have a postage stamp affixed before being placed in this bin.

### **Facsimile Machine (FAX)**

The Department has a FAX machine (617-353-6340) located in BRB 101 that is available for general departmental use. FAX machines are quite simple to use; nevertheless, see Front Desk Staff for assistance if you need any help. Since FAX machines operate over telephone wires, all charges associated with its use will appear on a phone statement. The Department covers the cost of all local Fax's. All long-distance Fax's must be charged to your professor's telephone code. You must make your own arrangements with your advisor about using his or her telephone code to make these calls. Your incoming FAX messages will be placed in your mailbox.

### **Photocopying Procedures and Policies**

There are copying machines within the Department available for general use. In 5 Cummington Mall, BRB 101C, there is a large Canon copier. This room can be accessed from the corridor at any time. The key that opens all common spaces also opens this room.

Please keep in mind:

- To avoid conflict with routine office staff, large copying jobs should not be carried out between 9 AM and 5 PM, Monday through Friday
- Faculty and staff have priority at the copying machines
- If you have questions about how to use the machines please see Front Desk Staff in BRB 101

### **Using the Departmental Laser Printers**

There are several networked printers throughout the various biology buildings. For information on how to connect to these printers, see the front office in Biology for printers in 5 Cummington

Mall, or Peter Castellano for access to printers in 24 Cummington Mall. The main networked printer in 5 Cummington Mall is a “HP LaserJet 4050 Series”, located in BRB 101C. You can connect to this printer via its IP address, 128.197.80.190

## Computers

Many students choose to bring their own personal computers into their office or labs. A lock for a laptop is highly recommended. Boston University’s Information Services & Technology (IS&T) designed and maintains a number of computer labs, both physical and virtual, including the University’s primary PC lab in the BU Common @ Mugar and the Linux Virtual Lab. Links for computing resources on campus, as well as information on where to obtain support for your personal computer can be found at [www.bu.edu/tech](http://www.bu.edu/tech). The College of Arts & Sciences offers a file server ([casfsb.bu.edu](http://casfsb.bu.edu)) to all faculty, staff, and students to back up and share their data. To establish a folder on this server, go to <http://www.bu.edu/casit/> click on “File Services” and follow the instructions.

## Internet

There are limited Ethernet connections within the department for Internet access. Check with your advisor for more information about ethernet port availability in your office. Wireless on campus is available in most academic buildings, but signal strength can vary floor to floor and building to building. To join the BU wireless network, you will need to accept the certificate for the secured and encrypted 802.1x security protocol with your user login and kerberos password. For more information on how to join the wireless network, go to <http://www.bu.edu/tech/accounts/wireless/> or stop by one of the IT Help centers at Mugar Library.

## Getting a BU Email Account

All new students will be given a BU Google Apps account and can log in to it at [www.bu.edu/google](http://www.bu.edu/google) or [www.bu.edu/webmail](http://www.bu.edu/webmail). You can enable this account by following the instructions on [www.bu.edu/tech/support/google/enable/](http://www.bu.edu/tech/support/google/enable/) If you have an existing email account that you prefer to use, you can forward your BU email using the Settings menu within BU Google Mail. Please note that all departmental communication will be sent to your BU email address.

## Getting on Biology Email Aliases

Once you have an email account, you will automatically be added to the all-department alias (“[bio-dept-list@bu.edu](mailto:bio-dept-list@bu.edu)”) and the graduate student alias ([bio-grad-students-list@bu.edu](mailto:bio-grad-students-list@bu.edu)) for the Biology Department as well as the alias for your specific program ([bio-grad-cm-list@bu.edu](mailto:bio-grad-cm-list@bu.edu), [bio-grad-ebi-list@bu.edu](mailto:bio-grad-ebi-list@bu.edu), [bio-grad-neuro-list@bu.edu](mailto:bio-grad-neuro-list@bu.edu))

## Memos and Announcements

Memos and announcements are routinely sent to graduate students via email. Also check the easel outside of BRB 101 for announcements.

## The Biology Media Center

The Biology Media Center in room 627 of 24 Cummington Mall provides a range of media services to the department for little or no cost. Available services are flatbed scanning, slide scanning, color laser printing, di-sub printing (photo-like prints) and large format poster printing. These facilities operate on both Mac and Windows platforms in order to handle the varied media

formats. Due to the popularity of the media center, there is a “reservation” policy. If you need to use the media center services, you should contact Peter Castellano via e-mail at pcastell@bu.edu, or telephone at 353-8736 to reserve a time to use the equipment. To facilitate the availability of these graphics resources, the associated computers are to be used only for departmental-related purposes and not for general use or e-mail.

## **Reimbursements & Travel**

### **Reimbursements**

Supplies, and other expenses incurred that are course or grant related, can be reimbursed if the proper procedures are followed. Reimbursements can be either check or direct deposit depending upon the amount and the nature of the expense. The University SAP and Concur Travel System is used to create reimbursements. All students are asked to contact their supervisor before making any out of pocket expenses. University regulations must always be followed. If you make a purchase you **MUST** have the original receipt and/or proof of payment. Shipping lists, on line order confirmations are not valid for reimbursement.

### **Petty Cash**

A cash reimbursement can be made under the following conditions:

1. Supplies are needed the same day.
2. Supplies are not normally available through the Biology stockroom.
3. An original receipt is given for each reimbursement.
4. The receipt is under \$10.00.

### **Travel and Airfare**

A reimbursement form may also be used for travel-related expenses. In the Biology Department, see the Financial Administrator, Rich Rigolini or Barbara Caloggero in the Biology main office. Please speak to your supervisor about any and all travel plans before you make any reservations. The university has strict policies regarding travel and procedures to purchase airline tickets.

### **Travel Advances**

Travel advances are on a per request basis. University travel cards are to be requested via the Department Business Manager. These cards are usually for full time faculty and staff only. Students should ask their PI for more information regarding travel.

### **Clearing a Travel Advance and Travel Reports**

Travel must always be cleared with the university as soon as the trip is complete. The use of a personal car can only be reimbursed for the mileage at the University mileage reimbursement rate. Receipts for gasoline purchase are accepted for car rentals or a University vehicle, but not for personal car use.

## Sexual Misconduct/Title IX Guidelines

Title IX of the Education Amendments of 1972 is a federal civil rights law that prohibits sex-based discrimination in federally funded education programs and activities. Sex-based discrimination includes sexual harassment and sexual violence, such as rape, sexual assault, sexual battery, and sexual coercion. The law covers sex-based discrimination against students, faculty, and staff.

Persons seeking to file a complaint should contact:

- Dean of Students Office | 617-353-4126
- Title IX Coordinator Kim Randall | [krandall@bu.edu](mailto:krandall@bu.edu) | 617-353-9286
- Boston University Police Department | 617-353-2121
- Jessica Aither, Graduate Services Administrator (Graduate students) | 617 - 353-2696

The Department of Biology expects that the learning and work environment will be free from all forms of sexual misconduct which includes sexual harassment, sex/gender discrimination, sexual assault, rape, stalking, and relationship violence. Such behavior is unacceptable, and serves as a barrier to the educational, scholarly, and research goals of the University.

- “Affiliates” as defined by Boston University includes faculty, graduate and professional students, postdoctoral fellows and associates, teaching assistants, graders and University staff and volunteers who supervise students. Affiliates should not instruct, evaluate, supervise (directly or indirectly) a student’s academic work or participation in University programs, housing, activities, or employment. Affiliates should avoid supervising any student with whom the affiliate has had a romantic or sexual relationship in the past or entering into a romantic or sexual relationship with any student over whom the affiliate reasonably expects to exercise supervisory authority in the future.
- All affiliates who are not students (enrolled in any and all education training programs of the University) should avoid entering into romantic or sexual relationships with undergraduate students, regardless of whether or not they exercise supervision over a particular student.
- Professors should avoid dating members of their laboratory (i.e., graduate students, technicians, or postdoctoral fellows). If such a relationship exists, the member of the lab should consider and/or be advised to change labs. If the student remains in the lab, the professor must excuse him or herself as an official member of all evaluating committees (e.g., qualifying and defense committees) for the student, and can only serve as an ad hoc non-voting member of the committees. Remember that although both parties may initially consent to this relationship, it is only the professor, by virtue of his/her special responsibility, who is held accountable for unprofessional behavior.
- A professor dating a graduate student from another laboratory must excuse him or herself from all evaluating committees (e.g., qualifying and defense committees) for the student.
- Do not touch a student, technician, or postdoctoral fellow except with the universally accepted handshake. Hugs, kisses, high-fives, or slaps on different regions of the body may be acceptable in American culture, but may be interpreted in unintended ways by students of other cultures.
- When meeting alone with a student, keep your door open if possible.

- Do not invite a student to your home when you and the student would be alone. Try to include more than one member of the class or lab in all social occasions.
- Inappropriate sexual comments and humor and jokes about sex or gender-specific traits in classrooms, laboratory sessions, or discussion sessions are not acceptable. Inappropriate messages may be subtle and even unintentional, but nevertheless these comments compromise the learning experience of the students.
- When hanging material on doors or walls, be sensitive to other people's feelings.

Boston University recognizes that sexual assault, harassment, discrimination and other forms of sexual misconduct can have a profound impact on a person's personal, academic, and work life. The University encourages anyone coping with such a situation to seek help and support. Students who are uncertain of their options or simply need help should call the Sexual Assault Response & Prevention Center ("SARP") at (617) 353-7277.

Any University employee, including student employees whose duties include supervision or teaching of other students (e.g. Teaching Assistants, Teaching Fellows, etc.), who receives a complaint or otherwise learns about a possible incident of sexual misconduct involving a member of the Boston University community as complainant or alleged perpetrator must complete a Sexual Misconduct Report Form with the University's Title IX Coordinator.

## Compliance

Each student, admitted to the Graduate School of Arts & Sciences, is responsible for becoming familiar with the general regulations of the Graduate School as stated in the "Policies" section of the Graduate School of Arts and Sciences Bulletin and with the more specific requirements stated in the individual section on each department, division, or program which may go beyond, or supplement, the Graduate School standards.

If necessary, the Graduate School of Arts & Sciences staff is available to interpret or clarify any rule or regulation.

Boston University does not permit a student to enroll simultaneously in more than one graduate program either within Boston University or at another institution, unless those programs have been previously approved by the Trustees of Boston University as a combined degree program.

In order to register:

- Boston University requires all students studying on Massachusetts campuses to provide a BUAlert phone number.
- Boston University requires all students to Settle their Financial Obligation each semester.
- Massachusetts law requires that all full-time and many part-time students be Immunized against a number of diseases in order to attend a university in the Commonwealth.
- The Massachusetts Motor Vehicle Law requires that all out-of-state students sign an acknowledgement that they have been informed of the law. (Compliance required in the Fall semester only)

Check the Student Link to ensure you have met these requirements. Students not in compliance will be unable to register for future semesters.

## Childbirth and Adoption Accommodation for Full-Time PhD Students

Please find the official University policy here: <http://www.bu.edu/academics/policies/childbirth-and-adoption-accommodation/>

The childbirth and adoption accommodation policy for full-time or certified full-time Ph.D. students in good academic standing provides for extensions for academic coursework and other requirements to the primary caregiver of an infant or adopted child. It also provides for a continuation of stipend support for funded students during the accommodation period.

A GRS full-time or certified full-time Ph.D. student taking an accommodation due to the birth of a child should notify the relevant department Chair or Program Director in writing no later than 30 days prior to the start of the semester during which the birth is expected using the procedures described below. In the case of adoption, notification should be made once the student becomes reasonably certain of the expected dates of adoption.

### Notification procedures:

Students have two options for notifying the relevant offices:

1. **By email:** Please include the following information in an email with the subject: "GRS Childbirth and Adoption Accommodation" to your department Chair or Program Director, copying your Director of Graduate Studies, the GRS Director of Admissions & Financial Aid at [grsaid@bu.edu](mailto:grsaid@bu.edu), and if a research assistant, the Principal Investigator of the research project on which you are working:
  - Your name
  - BU ID number
  - Program
  - Expected date of birth or adoption
  - The start and end dates of the 60-day accommodation period if known, or approximate dates if not

The Chair or Program Director must acknowledge receipt of this email via a reply to all parties initially included.

If you are expecting to be a Teaching Fellow during the semester in which you take the accommodation, this must be discussed with your department/program and GRS Financial Aid; if you are expecting to be a Research Assistant, the details surrounding the accommodation must be determined at the department/program level.

2. **By form:** Please complete a notification form from the GRS website, obtain the necessary signatures, and submit to the GRS office – 112 College of Arts & Sciences Building.

## Health Resources

### Student Health Services

881 Commonwealth Avenue | 617-353-3575

Center that meets student health care needs while at Boston University. Includes Primary Care, Sports Medicine, and Behavioral Medicine service by appointment or on an emergency basis, and Crisis Intervention Counselors. Department of Wellness & Prevention Services, which includes Alcohol and Other Drug evaluation and education, as well as general health education. The Athletic Training Services Department at Boston University is a part of the SHS family. SHS is here to help address immediate and ongoing health care needs.

You may use Student Health Services if you meet one of the following criteria:

1. A full-time BU student, regardless of your insurance choice.
2. A student who participates in at least 9 credit hours.
3. Any student with the Student Health Insurance Plan.
4. A summer student or a participant in one of the high school summer programs.

### Dental Care

Students in need of dental care are referred by Student Health Services to qualified local dentists. Students are responsible for dental charges. Students may enroll in a preventive dental plan available from the Boston University Henry M. Goldman School of Dental Medicine by calling 617-638-4700. In addition, Aetna Student Health offers a Dental Discount Program to Boston University students.

### The Danielsen Institute

185 Bay State Road | 617-353-3047

The Danielsen Institute offers a variety of psychological services, including individual, group, family, and couples therapy, as well as psychological testing and assessment for adults, adolescents, and children. Many insurance plans, including Boston University's Aetna Student Health Plan, can be used to cover a portion of applicable fees, and a sliding fee scale is also available.

### The Center for Anxiety & Related Disorders (CARD)

648 Beacon Street, 6th Floor | 617-353-9610

The Center for Anxiety and Related Disorders (CARD) is an internationally known clinical and research center dedicated to advancing knowledge and providing care for anxiety, mood, eating, sleep, and related disorders. At CARD, expert clinical care is provided and, at the same time, research is ongoing to expand the range and style of successful treatment options for patients in need. Individuals seeking care at CARD will have the direct benefits of clinical care that is informed by previous research, and likewise will have opportunities to participate in ongoing research designed to further advance what is known about the nature and treatment of anxiety and related disorders. Fees are based on a sliding scale, and some treatment associated with research studies may be free of charge.

## Student Life Resources

### Graduate Student Groups

**Biology Graduate Student Association (BGSA):** An organization comprised of graduate students within the Department of Biology and MCBB programs dedicated to increasing the level of academic, scientific, and professional integration between the four program areas in the Department of Biology through academic and recreational activities. These four program areas are: Cell and Molecular Biology (CM/MCBB), Ecology, Behavior, and Evolution (EBE), Marine Biology (BUMP), Neurobiology (NEURO). [bgsa@bu.edu](mailto:bgsa@bu.edu)

**Graduate Women in Science and Engineering (GWISE):** A community to support and promote women in science, technology, engineering, and math fields. Through professional development seminars and workshops, social events, mentoring, and outreach, GWISE fosters interaction across disciplines at Boston University and connects graduate students to post-docs, faculty, and broader networks in Boston and beyond. GWISE is open to men and women. Groups within GWISE consist of accountability groups for thesis writing, book club, coffee groups, intramural sports, mothers' group, yoga and WISE guys, a program to increase the participation and engagement of men in GWISE. <http://www.bu.edu/gwise/>

**Graduate Student Organization (GSO):** The GSO is the official representative body of the graduate students in the Arts and Sciences at Boston University. <http://www.bu.edu/gso/>

The purpose of the GSO is:

- To provide a forum for the discussion of matters pertaining to the welfare of graduate students at BU.
- To advocate on issues of concern to our graduate student community.
- To serve as a liaison between the graduate student body and the BU administration.
- To recommend graduate students to serve on BU committees for which graduate representation is necessary.
- To assist with the process of integrating new students into graduate student life at BU.
- To sponsor social activities and other events that encourage the development of the graduate student community.
- To foster effective communication and cooperation among undergraduate students, graduate students, faculty, staff and other members of the community.

### Office of the University Ombuds

19 Deerfield Street, Suite 203 | (617) 358-5960 | [ombuds@bu.edu](mailto:ombuds@bu.edu)

The Boston University Office of the Ombuds is an independent, impartial, informal, and confidential resource available to all members of the Boston University community. Confidentiality, one of the fundamental principles of the office, is essential to Ombuds practice. The Office provides a safe place to have off-the-record conversations about any kind of problem related to life at BU. Talking to the Ombuds can be a good first step to resolving problems, especially if you are concerned about confidentiality or don't know where to turn for assistance.

## International Students and Scholars Office

[www.bu.edu/isso/](http://www.bu.edu/isso/) | 888 Commonwealth Avenue | 617-353-3565 | [isso@bu.edu](mailto:isso@bu.edu)

The International Students and Scholars Office (ISSO) is a resource for professional expertise on immigration and employment, and help ensure student, scholar, and institutional compliance with federal regulations. ISSO staff are available to guide students and scholars through the often complicated requirements for foreign nationals studying and working in the United States.

## Office of Family Resources

[www.bu.edu/family](http://www.bu.edu/family) | 985 Commonwealth Avenue | 617-353-5954 | [chippie@bu.edu](mailto:chippie@bu.edu)

The Office of Family Resources is committed to helping families manage the challenges of work life and family life and provides many resources and services to support families of the Boston University community.

Resources and services available include:

- Referral service and resource materials for parents seeking childcare
- Information about how to find Boston University students interested in babysitting
- Educational programs co-sponsored with the Faculty/Staff Assistance Office
- School vacation programs for children in Kindergarten through fourth grade during the February and April school vacation weeks
- Recreational summer camp program for children entering Kindergarten through fourth grade during summer school vacation weeks
- Elder care resource materials

## Fitness & Recreation Center | Physical Education, Recreation & Dance

915 Commonwealth Avenue | 617-353-2748 | [fitrec@bu.edu](mailto:fitrec@bu.edu)

All full-time graduate students receive free membership to the FitRec. The Fitness & Recreation Center offers a variety of state-of-the-art facilities, including an 18,000-square-foot weight and cardio room, two swimming pools, racquetball and squash courts, two multi-use gymnasiums, an elevated jogging track, a 35' climbing wall, a Pro Shop, and the Healthy Blends Café. Physical Education, Recreation & Dance offers for-credit and non-credit classes in everything from fitness to climbing to martial arts. The department also coordinates all intramural and club sports programs.

## Educational Resource Center

100 Bay State Road, 6th Floor | 617-353-7077 | <http://blogs.bu.edu/erc/>

The Educational Resource Center provides academic support programs to the University community, including peer tutoring, the Writing Center, Language Link conversation groups, and various workshops. These services are available free of charge.

## BU Parking and Transportation Services

1019 Commonwealth Avenue | 617-353-2160 | <http://www.bu.edu/parking/>

Boston University Parking & Transportation office provides students, staff, and faculty information on various ways to travel in and around Boston. This office provides information on: Parking permits, parking lots and locations, parking regulations and towing, weather related emergencies, the BU Bus, rideshare, bike safety, zip car, and MBTA (the "T") passes and transportation.

## BU BUS

The Boston University Shuttle (the BUS), is an inter-campus shuttle service with 11 stops between the Charles River Campus and the BU Medical Campus. BU ID is needed to board. During the academic year, the BUS operates every 15 minutes (7AM – 10AM & 4PM – 7PM) Mondays – Thursdays, and every 20 minutes on Fridays. The BUS provides 30-minute off-peak service from 7AM until 11PM. During the summer, the BUS runs every 30 minutes between 7AM and 11PM. More information about the BUS service is available online. Evening & Weekend Shuttle provides service 7 days a week during the evening and early morning hours. The shuttle, which runs until 2:00AM Sunday-Wednesday and 4:00AM Thursday-Saturday, is intended to provide the Boston University community with convenient transportation exclusively throughout the Charles River Campus.

## The Center for Gender, Sexuality and Activism

775 Commonwealth Avenue, Lower Level | 617-358-5575 | [cgsa@bu.edu](mailto:cgsa@bu.edu)

The Center for Gender, Sexuality and Activism (CGSA) strives to be a safe space for people of all genders and sexualities. Using a social justice framework, the CGSA aims to end gender oppression and violence, and advocates for the full equality and inclusion of women, queer and trans students. This dynamic community fosters challenging and open discourse, promotes student activism, and provides resources and education for the Boston University Community.

## Chaplains

735 Commonwealth Avenue | 617-353-3560 | [chapel@bu.edu](mailto:chapel@bu.edu)

A variety of chaplains are available to all students, regardless of religious affiliation. Appointments can be scheduled, or students can visit the chapel office on weekdays between 9 a.m. and 10 p.m.

## The University Service Center (USC)

881 Commonwealth Avenue | 617-358-1818 | [usc@bu.edu](mailto:usc@bu.edu)

The USC is an excellent starting point for anyone unsure of where to turn for help. The staff will point you in the right direction, or—if your concern is complex, multilayered, or involves multiple offices—help you figure out the best way to address the situation.

## Disability Services

19 Deerfield Street, 2nd Floor | 617-353-3658 | [access@bu.edu](mailto:access@bu.edu)

Disability Services provides services and support to ensure that students with disabilities are able to access and participate in the opportunities available at Boston University. Disability Services also employs students as note-takers, readers, and in other positions assisting disabled students.

## The Howard Thurman Center

775 Commonwealth Avenue, Lower Level | 617-353-4745 | [thurman@bu.edu](mailto:thurman@bu.edu)

The Howard Thurman Center is Boston University's center for cultural learning and collaboration. Through a variety of workshops, programs, and celebrations, the Howard Thurman Center aims to build community by eliminating barriers of divisiveness that separate individuals, groups, races, cultures, religions, and ethnicities.

## Judicial Affairs

19 Deerfield Street, 3rd Floor | 617-358-0700 | dos@bu.edu

The Judicial Affairs office and student safety programs serve as the primary administrators of the Code of Student Responsibilities and also provide information and resources to the University community regarding personal safety on and off campus.

## Boston University Police Department

32 Harry Agganis Way | 617-353-2121

Anonymous Tip Line: Text the BUPD at tip411 (847411) and type BU <space> your message

The Boston University Police Department is a full-time, professional law enforcement agency that also provides a wide variety of public services, including emergency medical response, Rape Aggression Defense classes, and laptop and bicycle registration. Through the community policing program, officers are assigned to various areas of campus to work closely with the community in addressing crime and crime prevention, as well as social issues, which directly affect the quality of life at Boston University.

## Environmental Health & Safety

704 Commonwealth Avenue, 2nd Floor | 617-353-4094 | oehs@bu.edu

Environmental Health & Safety provides a full range of environmental, health, and safety services to the University community. These services include, but are not limited to, fire and life safety programs and support of the University's recycling program.

## Dean of Students

775 Commonwealth Avenue, 3rd Floor | 617-353-4126 | dos@bu.edu

The mission of the Dean of Students office and the Division of Student Affairs is to enhance the quality, character, and perspectives of our students. Through its many orientation, mentoring, and counseling programs, the division promotes an environment that encourages intellectual exchange and individual expression. The dean of students has an open-door policy and is available to all students by appointment.

## Career Resources

### Center for Career Development

100 Bay State Road, 6th Floor | 617-353-3590 | future@bu.edu

The Center for Career Development can assist students in choosing a major, finding an internship, or preparing for their post-college job search. Services include workshops, job and internship fairs, résumé review, mock interviews, and career assessment tools.

### BU Broadening Experiences in Scientific Training (BEST)

[www.bu.edu/BEST](http://www.bu.edu/BEST) | Twitter @BU\_s\_BEST

Program Director, Chelsea Barbercheck: crepler@bu.edu

Supported by the National Institutes of Health, BU's BEST facilitates biomedical career development curriculum for PhD and postdoctoral trainees in a way that explores careers both in and outside of standard academic research. BU's BEST program is open to all biomedical graduate and postdoctoral trainees at Boston University.

## Propel Careers

Lauren Celano, Co-founder and CEO | <http://www.propelcareers.com/>

Propel Careers is a Boston based life sciences search and career development firm dedicated to networking, mentoring and career development. Propel focuses on placement into full time, project based, and internship roles in areas including research, clinical, regulatory, commercial, informatics, finance, business, development, legal, and operations.

## LinkedIn

Connect with Christina Honeycutt on LinkedIn to interact with our alumni community. There are over 120 alumni available for informational interviews and general networking questions.

## Other useful links for job-seekers:

[www.nature.com/naturejobs](http://www.nature.com/naturejobs)

[www.higheredjobs.com](http://www.higheredjobs.com)

[sciencecareers.sciencemag.us](http://sciencecareers.sciencemag.us)

[www.bu.edu/careers](http://www.bu.edu/careers)