Boston University School of Medicine
Department of Anatomy & Neurobiology

Doctor of Philosophy in Anatomy & Neurobiology

2022 -2023 Program Guidelines

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Table of Contents

All students should familiarize themselves with the Division of Graduate Medical Sciences (GMS) general policies and the program-specific requirements for the Doctor of Philosophy in Anatomy & Neurobiology Program found within this document. Supplement to Boston University Division of Graduate Medical Sciences Guidebook. (www.bumc.bu.edu/gms/students/policies-procedures-handbook)

GUIDE FOR DOCTORAL CANDIDATES

A. Overview of the PhD Program

The program for the PhD degree typically consists of two years of fundamental course work and three to four years of research, the results of which are incorporated into a dissertation. Students must also pass the Qualifying Examination (QE), an examination with both written and oral components, typically taken at the end of the second year. After the successful completion of the qualifying exam, the student spends the remainder of time in the program performing research in support of their dissertation and fulfilling teaching requirements. The expected timeline for completion of the PhD degree is 4-6 years. The PhD program has a 7-year time limit for completion following matriculation into the program.

The Bulletin of the Division of Graduate Medical Sciences, under Academic Policies and Procedures, describes the procedures involved when a student must extend their period of study beyond these limits. http://www.bumc.bu.edu/gms/gateway/students/ma-and-ms-programs/policies-procedures/

The goals of the Doctor of Anatomy & Neurobiology Program are to provide trainees with the knowledge base and skills to become proficient in basic biomedical research and to develop outstanding pedagogic skills. Successful completion of these goals enables our students to pursue further studies in the biomedical sciences including teaching, research, and health care. At the conclusion of the program students will be able to:

- Demonstrate an understanding of Anatomy, Neuroscience, Statistics, and other graduate-level elective anatomical and neuroscience topics through successful completion of our core curriculum.
- Demonstrate proficiency in pedagogical skills in the context of the Teaching in Biomedical Sciences course and through teaching fellowships in advanced biomedical courses (as listed above).
- Demonstrate an understanding of pedagogical theory through the development of a mentored Vesalius teaching practicum, which involves the development of a didactic lesson or exercise under the direct mentorship of department faculty.
- Demonstrate proficiency in scientific data acquisition and analysis through mentored research in one of the department's research labs.
- Describe and interpret scientific findings of their laboratory research study through the development of a written, publication-quality thesis.
- Demonstrate an understanding of the professional skills (including an ability to read and interpret scientific literature) required of biomedical scientists and educators.

B. Requirements for the PhD Degree

1. PhD in Anatomy & Neurobiology Coursework

The program of study for the PhD degree requires 64 graduate credits of coursework and research, of which half may be satisfied by the MS degree or equivalent. Specific core course requirements are outlined in subsequent

pages. If it is deemed that an equivalent and appropriate course has been successfully completed in the three years preceding matriculation into the program, the student may petition the Graduate Education Committee (GEC) to be exempt from a course. If the petition is approved, then the course may be substituted for another course. Requests to substitute a course must be submitted in writing to the GEC before the time of registration

2. Qualifying Examination (QE)

The Qualifying Examination (QE) consists of both written and oral parts and is designed to test the student's scientific writing and communication skills based on an original research proposal that may or may not be the focus of the student's dissertation. It will also expose the student to the grant writing process. Students typically take this examination during the spring semester in the second year of graduate study.

If a student chooses a primary research advisor who is faculty from another department, they should also choose a departmental advisor from A&N faculty, who will petition and help the student prepare for the Qualifying exam, be a member of the student's RAC and be second reader for the dissertation.

3. Research

Scientific research in the Department of Anatomy & Neurobiology focuses on advancing knowledge in the fields of anatomy and/or neurobiology. Anatomical and/or neurobiological research must be the principal focus of student dissertations; students may include education research as a complementary component of the dissertation.

Students typically rotate through labs in the spring of their first year and become affiliated with a faculty member and their research laboratory by the end of their first year in the Program. This faculty member will serve as the primary research advisor and will supervise the student's research. Additionally, the student will assemble at least two other faculty members to serve as members of their Research Advisory Committee (RAC). This committee is constituted no later than the semester in which the QE is passed. As the student approaches the completion of their research project, they must assemble a Dissertation Examining Committee (DEC). After submission of the written dissertation to the DEC, the student will present their research at a Departmental seminar and immediately proceed to the oral defense of the dissertation by the DEC.

It is an annual requirement for PhD candidates to present their research work at the Henry I. Russek Student Achievement Day (e.g. abstract poster) in the spring. First and second-year PhD candidates are exempt from this expectation but may choose to present if sufficient research progress has been made.

4. Teaching

All students are required to participate as a Teaching Fellow in Departmental courses. Doctoral candidates will complete 160 hours of teaching during their tenure as a student; this requirement is typically completed over a three-year period.

C. PhD Coursework Requirements

This 64-credit doctoral program includes courses in anatomy and neuroscience; these courses are offered within this department or by related departments on the Medical Campus. An integral part of the program is the requirement for students to participate as Teaching Fellows in Graduate school courses as part of our Vesalius Teaching Apprenticeship. The PhD program is designed to produce well-rounded biomedical scientists who expect to include both research and teaching in their career.

The PhD curriculum consists of required courses, seminars, and electives as well as Dissertation Research. Overview of the 64-credit PhD program:

- Required Courses: 30-32 credits
- Electives and/or Research: 32-34 credits

1. Required Courses

Exptl. Design & Statistical Methods OR Elementary Biostatistics	2 Cr	AN 704/MS 700
Professional Skills	2 Cr	AN 715
Methods in Neuroscience	4 Cr	AN 718
Human Gross Anatomy OR Histology	6/4Cr	AN 719/AN 726
Fundamentals of Cell & Molecular Neurobiology	4 Cr	AN 777
Research Colloquium (Journal Club)*	2 Cr	AN 801/802
Vesalius 1: Teaching in the Biomedical Sciences	2 Cr	AN 806
Vesalius 2: Applied Teaching in the Biomedical Sciences (fulfilled by Teaching Fellow assignments)	2 Cr	AN 809
Systems Neurobiology	4 Cr	AN 810
Scientific Writing	2 Cr	AN 815
One Departmental Seminar Course and one Elective (see list below)	2+ Cr each	

Department Seminar Courses

Neurobiology of Learning and Memory (even years)	2 Cr	AN 702
Neurobiology of Aging (odd years)	2 Cr	AN 707
Neurobiology of the Visual System (on-demand**)	2 Cr	AN 807
Dynamic Modeling (on-demand**)	2 Cr	AN 820

Department Electives
(includes courses from programs in Forensic Science [FS], Forensic Anthropology [FA], and Imaging [IM])

Advanced Clinical Anatomy	2 Cr	AN 708
Developmental Cognitive Neuroscience	4 Cr	AN 716

Cellular Organization of Tissues	4 Cr	AN 722
Advanced Neuroanatomy (even years)	2/4Cr	AN 724
Neuroanatomy Through Clinical Cases	4 Cr	AN 725
Vesalius III: Teaching Practicum	2 Cr	AN 805
Cognitive Neuroscience	4 Cr	AN 811
Human Anatomy and Osteology	4 Cr	FA 712
Advanced Human Osteology	4 Cr	FA 806
Forensic Biology	3 Cr	FS 702
Forensic Pathology	3 Cr	FS 712
Molecular Biology of Forensic DNA	3 Cr	FS 720
Biomedical Imaging Foundations	4 Cr	IM 600
Methods of Functional Imaging of the Brain	2 Cr	IM 630
Molecular Basis of Neurologic Disease	2 Cr	MS 783

**Journal club is taken once every year but only one time for credit*
***on-demand = course should be requested by 4 students or more*

Students are expected to submit course evaluations of all courses taken in the academic year.

2. Requirements for the Optional PhD Vesalius Module

Students are required to have taken at least two of the following prerequisite courses to pursue the Vesalius Module:

Human Gross Anatomy	6 Cr	AN 719
Histology	4 Cr	AN 726
Systems Neurobiology	4 Cr	AN 810
Cognitive Neuroscience	4 Cr	AN 811

The module consists of three courses/components, two of which are required courses for all PhD students (Vesalius 1 & 2). The program begins with a course on the development of teaching skills in the biomedical sciences. This is followed by a teaching apprenticeship (160 hours of service as a Teaching Fellow in one or more of the graduate required courses, above), and a Mentored Teaching Project that involves the development of a didactic lesson or exercise under the direct mentorship of experienced, award-winning faculty.

Vesalius 1: Teaching in the Biomedical Sciences	2 Cr	AN 806
Vesalius 2: Teaching Apprenticeship	2 Cr	AN 809
Vesalius 3: Mentored Teaching Project (Practicum)	2 Cr	AN 805

Example of a typical curriculum for PhD students *

Year 1: Fall

Systems Neurobiology	4 Cr	AN 810
Research Colloquium (Journal Club)**	2 Cr	AN 801
Human Gross Anatomy	6 Cr	AN 719

Year 1: Spring

Professional Skills	2 Cr	An 715
Vesalius 1: Teaching in the Biomedical Sciences	2 Cr	AN 806
Methods in Neuroscience	4 Cr	AN 718
Graduate Histology	4 Cr	AN 726
Elective(s) (see list above)	2-4 Cr	

PhD students typically rotate through 2-3 labs during the spring semester of Year 1, and they must meet with each PI at least twice; at the start and end of their rotation (each rotation should run for ~4-8 weeks). During these meetings, the PI and student must complete a rotation form to be submitted to the program director. If a student wishes to join a lab, it is their responsibility to inform the PI. Once a student and PI have agreed that a student will join the lab, the program director must be notified.

Year 2: Fall

(Most PhD students begin the mandatory Responsible Conduct in Research Training, pg. 14)

Exptl. Design & Statistical Methods or Elementary Biostats	2 Cr	AN 704/MS 700
Fundamentals of Cell & Molecular Neurobiology	4 Cr	AN 777
Scientific Writing	2 Cr	AN 815

Year 2: Spring

(PhD students take the Qualifying Exam, pg. 8)

Advanced Seminar (1 required, see list above)	2 Cr
Elective(s)	Variable

Year 3: Fall

Research	Var Cr	AN 901/902
Elective(s) (see list above)	Var Cr	
Vesalius 2: Teaching Apprenticeship (continues to 160 hrs)	2 Cr	AN 809

Year 3: Spring

Research	Var Cr	AN 901/902
Elective(s) (see list above)	Var Cr	
Advanced Seminar (see list above)	Var Cr	

Years 4 & 5: Spring-Fall

Research and Dissertation	Var Cr	AN 901/902riable

***Note: Per GMS policy PhD students must be registered full time (12 cr) every semester. If coursework does not add up to 12 credits, students should register for Anatomy Research (AN 901/902) to fill the remaining credits.**

Elective Courses

Students may take courses offered by the Department of Anatomy & Neurobiology and/or courses offered by other Departments at Boston University to fulfill this requirement.

3. Grades

To receive credit in any course taken as part of the doctoral degree program, students must receive a grade of B- or better. If a student receives a grade of C+ or lower in any of the departmental core courses, the student is no longer in good academic standing and the course must be remediated in a manner deemed appropriate by the GEC.

When the work of a course has not been completed within the semester of registration, a grade of I (Incomplete) may be given at the discretion of the instructor. A grade of I can only be given if the student is in good academic standing. This becomes a permanent grade of "I" unless the course work is completed within 12 months from the time the incomplete grade is assigned, per GMS guidelines. Permanent grades of I are interpreted as F.

4. Course Load

Per GMS policy, PhD students must be registered full-time (12 credits) every semester. If coursework does not add up to 12 credits, students must register for Anatomy Research (AN 901/902) to maintain full-time status. The focus of the first two years of study is completion of the core and elective course requirements, though a combination of academic and research credits is allowed during this time. PhD students continuing during the fall must register for Summer II by submitting the PhD Summer Research Status Form. Submitting this form establishes full-time status during summer; this form does not satisfy the mandatory registration for the final two semesters during which degree requirements are completed.

D. Qualifying Examination for Doctoral Candidates

1. Overview of the Qualifying Examination (QE)

The Qualifying Examination (QE) for Doctoral Students consists of both written and oral parts and is designed to address those qualifications that any researcher, especially in academia, requires and depends on, i.e., the ability to:

- Critically evaluate published data, present in many independent sources, and generalize findings available.
- Formulate the need for addressing a set of new research questions and defend their significance.
- Plan a logical research project based on their preliminary data and others' published data, with attention to detail and clear vision of potential problems, theoretical or methodological.
- Write scientific text.
- Present and defend their proposal orally, in front of peers, professional scientists and academics.
- Reveal both knowledge and critical thinking while answering questions related to the proposal.
- Follow the rules/forms and meet deadlines.

The Examination is typically given in the spring semester of the 2nd full-time year of graduate study. By the beginning of the academic year (September), students who plan to take the Qualifying Examination in

the following spring have to submit a letter of intent to the Graduate Education Committee (GEC), per GEC Guidelines. Pre-qualifications include Scientific Writing (AN 815) and successful completion of sufficient core courses to provide a foundation for the proposal, as deemed necessary by the advisor(s) and GEC.

Students who receive GEC approval to take the Qualifying Exam must register with the Chair of the Qualifying Exam Committee by the last Friday of November preceding the semester in which they plan to take the exam. Exam registration is completed by submitting a letter to the GEC which declares the title of the research proposal. Research topics should be standard biomedical research projects appropriate to the expertise of the department and the student's advisor(s). The letter must be signed by the student and their advisor in the Department of Anatomy & Neurobiology (co-signed by an outside advisor, if applicable).

Failure to register or submit the materials by the stated deadlines disqualifies the student from proceeding with the examination. The QE can only be postponed under circumstances deemed significant and reasonable by the QEC and GEC.

2. Qualifying Examining Committee (QEC)

The QEC is composed of five members. The Committee examiners are members of the Department of Anatomy & Neurobiology and Division of Graduate Medical Sciences or members of a Graduate School at Boston University.

DEADLINE DATES (approximate and will be confirmed each year)

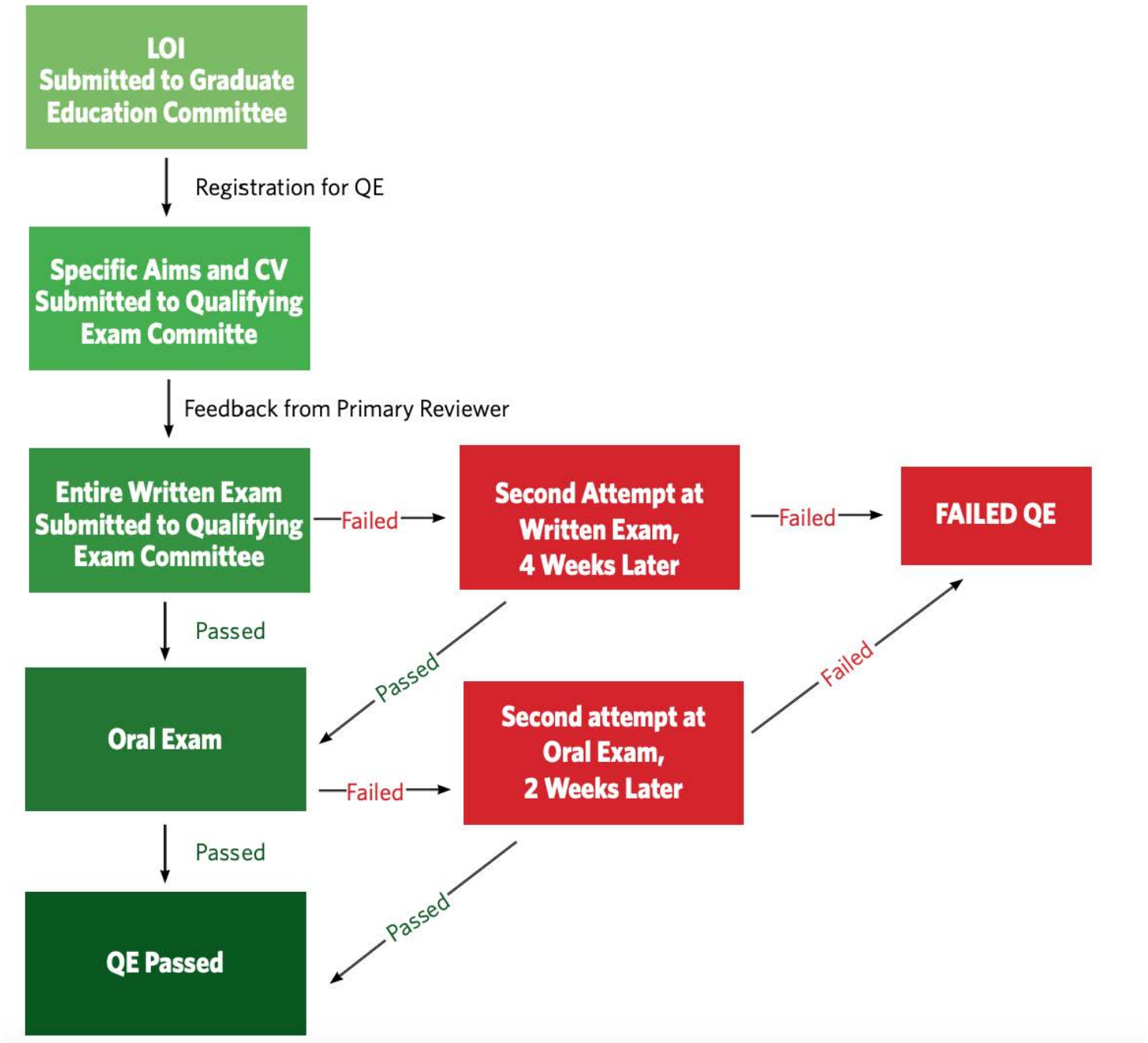
- Letter of Intent (LOI) to GEC: Last Friday of September
- Registration deadline: Last Friday of November
- Submission of form pages and Specific Aims: Last Friday of January
- Submission of Written Proposal: First Monday of March
- Oral Examination: Third Monday of March

In early December, the students will meet with the QEC Chair and/or one of the Committee members, who will explain all procedures and requirements in detail and answer any questions the students may have at that time.

Each student is required to have an actively-involved Research Advisor in the Department of Anatomy & Neurobiology. When the student is conducting research in another institution/department as part of a collaboration between the institutions, both advisors must be equally involved in the QE process. This will include:

- Providing a letter to GEC recommending the student to take QE.
- Carefully assessing the scientific rigor and approving the Specific Aims before they are submitted to the QEC.
- NOT being involved in the process of writing the Research Plan.
- Being present at the oral portion of the QE and, if requested, being available for further discussion of the outcomes of the student's presentation with the QEC

The Qualifying Exam Process and Timeline:



NOTE: In case a student fails the written or oral portion of the exam, the second (and final) attempt will be scheduled for the same year.

3. Written Examination

In order to assess the student's scientific reasoning and writing abilities, the Exam will require students to write a grant proposal in the format of an NIH NRSA F31 proposal for a pre-doctoral biomedical research project. The application materials can be downloaded at: https://grants.nih.gov/grants/oer.htm. Examples of previously submitted passing written and oral presentations will be made available to students.

The proposal will consist of NRSA form pages, Specific Aims, Background and Significance, Preliminary Studies (this section is optional), Experimental Design and Methods, Vertebrate Animals and Literature Cited sections. While the guidelines for the size of the NRSA application as submitted to NIH differ from year to year, the format of the written portion of the QE Research Plan will be limited to 10 pages (plus one Specific Aims page, and more than a current limit for "real" NRSA application).

The proposal must represent the student's independent work; however, the student should consult their advisor on the formulation (but not writing) of the Specific Aims. During the preparation of this proposal, students may consult with fellow students, their advisor and/or other faculty with regard to scientific approaches and ideas but they may not receive any actual writing, editing or proofreading assistance.

By noon on the January deadline, registered students will submit the following NRSA F31 pages to the QEC: Specific Aims, Biosketch for Student and Advisor(s), and Graduate Courses completed. These will be submitted electronically via email, as one PDF file attachment to the Chair of the Qualifying Exam Committee, with an additional copy to all the Committee members.

Each proposal will be read by the entire Committee. Students will be provided with feedback regarding the Specific Aims, and may then commence with preparation of the NRSA proposal. The written examination (i.e., complete NRSA application) will be due by noon on the first Monday of March.

By the end of the second week in March, the exam will have been evaluated by the QEC and the student informed as to whether they have passed, passed with minor modifications required, or failed the written exam (two or more fail votes).

The QEC will provide feedback with recommendations to both the student and their advisor regarding their performance on either portion of the exam.

If the student passes the written exam, they will take the oral exam during the third week of March. Any minor modifications required by the committee will be addressed orally at the time of the oral exam. If the student fails the written exam, they will not proceed to the oral exam; instead, they will receive oral feedback on a list of issues to be addressed and will have one opportunity to re-write the exam within a month thereafter.

4. Oral Examination

The oral examination will take place approximately two weeks after the successful completion of the written examination. The student may practice their presentation in front of fellow graduate students for feedback but cannot receive assistance from their advisor.

To the extent possible the entire committee will be present for the oral examination. The advisor(s) must attend the oral examination but cannot participate unless specific questions are directed to him/her by the Examining Committee.

The oral examination consists of two parts, which equally affect the outcome of the exam:

1. The student will give a 25-minute presentation of their research proposal based on the NRSA grant that was completed for the written exam. The oral PowerPoint-based (or similar) presentation should include a brief Introduction, Specific Aims and Hypotheses, the Rationale for performing the studies, Experimental Design and Statistics, and the Significance of the proposed studies. If the research is ongoing, preliminary data should be presented.
2. Following the presentation, for a period of ~40 minutes, the student will answer questions posed by the members of the QEC and broadly related to the presented grant proposal. The answers should reflect sufficient knowledge acquired from undergraduate/graduate courses taken and from scientific literature studied as part of research and QE preparation.

The student and their advisor will then be asked to wait in another room while the Committee members vote "Pass" or "Fail" by a written sealed ballot. The decision will be based on overall performance which includes well thought-out aims and hypotheses, well-designed studies and proposed data analysis, the ability to properly communicate and clearly present the research proposal and address questions posed by Committee members. The votes will be given to the Chair of the committee who will then inform the QEC and subsequently the student and their advisor of the result.

To pass the oral portion of the exam, no more than one fail vote will be permitted. The QEC will provide immediate feedback to the student and their advisor regarding the performance. Any student who fails their first attempt will receive a written list of points to be addressed.

If the student fails the oral examination, they will be allowed a second attempt two weeks after the initial presentation; the same rules and grading will apply.

E. Post-Qualifying Examination Policies and Procedures

1. Students are required to form a three-person minimum Research Advisory Committee (RAC, pg. 16) no later than May 1, following successful completion of their QE. The names of members must be submitted to the GEC for review and approval.
2. One member of the QEC will attend a research advisory committee as an ex officio member for the first 2 or 3 meetings to ensure that the research is on track. This could be continued longer if deemed necessary by the GEC. Any concerns will be reported to the GEC for resolution.
3. Students must hold their first research committee meeting in the fall semester following successful completion of the QE. Subsequent meetings must be held twice a year, once in the fall semester before January 1 and once in the spring semester before July 1.

4. The GEC will maintain a "tracking sheet" that will be used to document the discussions, issues, plans, and progress of each dissertation research committee meeting. This will be filled out by the ex officio QEC member for the initial meetings and later by someone on the committee other than the major advisor and submitted to the department to be maintained in the student's files.
5. After passing the QE, all students must present a 20-minute seminar to the Department during the spring seminar series. These presentations are scheduled by the PhD Program Student Representative and the Academic Coordinator.

F. Research Requirements for Doctoral Candidates

1. Overview of Research Requirements

During the first year of study, students engage in laboratory rotations to identify a faculty member and laboratory that aligns with their research interest. All students are expected to engage in full-time research during the summer of their first year. In subsequent years, students should aim to carry out full-time research when not involved in course work, teaching, or other degree requirements. The research carried out by the student will be agreed upon with the primary research advisor and RAC members.

Note: Prior to their dissertation defense, all PhD candidates are required to have a minimum of one published first-author, peer-reviewed original research article, based on their dissertation research.

2. Dissertation Work Outside of BU

Dissertation research is typically done "in residence" at the University, other than when it involves fieldwork or specialized data or evidence collection which is commonly done outside the University (e.g., in fields such as anthropology, astronomy, or particle physics or in the case of archival research). Dissertation research must be primarily supervised by a member of the BU faculty, who is approved by their department to play this supervisory role and the doctoral students research should be independent and original. Faculty members who are responsible for oversight of a dissertation project (including members of a student's dissertation/advisory committee) should not facilitate research outside of BU, unless the responsible faculty member(s) has (have) an active collaboration with a given researcher at an outside organization and doing this work offers clear benefits to the student.

Research underlying a dissertation may be conducted outside of BU when a faculty dissertation supervisor (or committee member) has a prior and active research collaboration with an organization outside of BU. Under such circumstances, specific permission must be granted by the Dean of the school or college in which the student is enrolled. The Dean should report the circumstances of each case of this variety to the Associate Provost of Graduate Affairs, to help ensure that the University's practices are consistent, recognizing that there are important differences among academic disciplines.

If the dissertation work will take place outside BU at a company or other for-profit entity, the student must complete a disclosure under the University's Investigator Financial Conflicts of Interest Policy for Research. This

disclosure must follow established procedures and be approved prior to the initiation of dissertation research.

BU is committed to sharing original dissertation research, and dissertations should be made available to the scholarly community in a timely manner. Faculty who oversee dissertation work should ensure that the student retains a right to publish dissertation materials in a timely fashion, and that any need to remove confidential or proprietary information does not undermine the academic integrity of the scholarship.

3. Responsible Conduct in Research Training (RCR)

All PhD students are required to complete the Boston University RCR training and should allot time for it during each semester until all modules are completed.

From the RCR website:

- Recommendations for individuals who are covered by NIH or NSF grants and, thus, have to meet compliance requirements: These individuals must complete Steps 1 and 2 (online training modules) within 30 days of the 14 start of grant support. Completion of these modules is required before signing up for the four workshops. All four advanced RCR workshops must be completed within two years.
- Recommendations for individuals who are not covered by an NIH or NSF grant: After completion of Steps 1 and 2 (online training modules), doctoral candidates are recommended to commence the four advanced RCR workshops in their second or third year and complete the four workshops at the rate of at least one workshop per semester. The goal is for all workshops to be completed by the end of the fourth year at the latest. Postdoctoral researchers are recommended to complete Steps 1 and 2 (online) as early as possible and commence the four advanced RCR workshops in the semester in which online preparation is completed.

For complete requirements and to sign up please visit the RCR website: RCR for Doctoral or Postdoctoral Researchers

4. Primary Research Advisor

During the time the student does not have a primary research advisor, the Graduate Program Director will advise students about their course selection. Once a primary research advisor has been selected, this faculty member will assume all advising responsibilities.

PhD candidates should become affiliated with a faculty member and their research laboratory by the end of their first year. This faculty member will serve as the primary research advisor and, in this role, will supervise the student's research and advise the student on course work. Doctoral candidates must make a final decision on the primary research advisor by the time the qualifying examination has been passed. This selection must be agreed upon by the student, the person selected as the primary research advisor, and the GEC. The proposed advisor should be able to adequately support the stipend and the research program of the graduate student.

The primary research advisor is typically a member of the regular faculty of the Department of Anatomy & Neurobiology, a faculty member of the Division of Graduate Medical Sciences, and must be approved by the GEC. A faculty member of the Division of Graduate Medical Sciences in another Department may also become a student's primary research advisor if approved by the GEC. Under certain circumstances, a special faculty appointee to the Division of Graduate Medical Sciences may serve as the primary research advisor if approved by the GEC. When the primary research advisor is not a full-time faculty member in the Department of Anatomy

& Neurobiology, then the second reader of the PhD dissertation must be a member of the regular faculty of the Department of Anatomy & Neurobiology and a faculty member of the Division of Graduate Medical Sciences. Additionally, in this circumstance, first and second readers must be appointed simultaneously. The primary research advisor is always the first reader of the PhD dissertation.
5. Research Advisory Committee (RAC)

Following successful completion of the QE, a Research Advisory Committee (RAC) consisting of **at least three faculty members** will be formed; the RAC will advise students on their research project. This Committee will consist of the primary research advisor and two other faculty members either from the Department of Anatomy & Neurobiology, another department within GMS, or Boston University Graduate School that best suits the needs of the student's research program. Again, if the primary research advisor is not a member of the A&N department, one other member of the RAC must be a member of the A&N department (this faculty member will also serve as the second reader of the student's dissertation). **The student should meet with their committee once a semester, once before January 1 and once before July 1**. These meetings are mandatory and should be arranged by the student.

One of the most important functions of the RAC is to assess the viability and significance of the proposed research project. In subsequent meetings, the RAC will consider the student's research results and research plan and advise accordingly.

The RAC should assist the doctoral candidate in the following ways:

1. Provide an opportunity for the student to periodically organize their data and plan their future research directions.
2. Provide for broader-based faculty input into a student's planning of their research.
3. Provide the opportunity for the second reader to have meaningful input into a student's progress.
4. Help prevent possible abuses in the student/advisor relationship, such as the Primary Research Advisor using the student as a means to get their work done, or the student relying too heavily on the Primary Research Advisor or the Advisor's technician

The student should note that the RAC must approve the final dissertation outline and two members of the committee (first and second readers) must sign the finished dissertation. Therefore, the advice of the RAC should be seriously considered by the student.

6. Dissertation Prospectus/Outline

Approximately 9 months prior to the student's expected graduation date the student prepares, in consultation with their primary research advisor, a Dissertation Prospectus/Outline. This document must be approved by three members of the student's proposed Dissertation Examination Committee and the Department Chairperson. The Dissertation Outline Approval Page is available on the GMS Website.

The Dissertation Prospectus/Outline and Dissertation Outline Approval Page must be submitted to the Division of Graduate Medical Sciences approximately 9 months prior to the student's expected graduation date. The

student MUST refer to the Graduate Medical Sciences "Graduation Calendar" for all Graduation deadlines. This information, along with other important graduation deadlines, can be found on the Division of Graduate Medical Sciences website. Graduate Medical Sciences.

The Prospectus should be typed, double-spaced and have the following format:

1. A title page with the name of the candidate, the proposed title of the dissertation, and the names in typescript and signatures of approval of the first and second readers, the third Research Committee member and the Department Chairperson.
2. The text should be made up of an abstract (maximum length of 1 page), and an outline of the aims of the research, the significance of the proposed research, preliminary data that has been collected, and a description of the methods to be used.

7. Writing of the Dissertation

The format and formal requirements for a dissertation are given in material that may be obtained from the Division of Graduate Medical Sciences (Guide for Writers of Theses and Dissertations, prepared by Boston University's Mugar Memorial Library). Arrangements must be made to present one bound copy of the dissertation in its final form to the Departmental Library.

8. Dissertation Examination Committee (DEC)

The Dissertation Examining Committee (DEC) will be constituted according to the rules of the Division of Graduate Medical Sciences. The committee normally consists of six members, including the Primary Research Advisor, the second reader, and a non-voting Chairperson. Of the five voting members, one or two may be from outside the Department of Anatomy & Neurobiology. **At least one member must be from an institution other than Boston University.**

Approximately 9 months prior to the final oral examination, the advisor submits the names of the Dissertation Examination Committee selected by the student and primary advisor to the Graduate Education Committee for approval.

9. Dissertation Defense (Final Oral Examination)

At least 3 weeks prior to the final oral examination the dissertation abstract is due in the GMS Division Office for review and approval by the Associate Dean. At least 2 weeks prior to the oral examination students must upload the Schedule of Oral Dissertation Defense and Examination form to the GMS student form page along with a word document of the approved abstract by the First Reader and Program Director / Department Chair.

Forms are available on the Division of Graduate Medical Sciences website and in Division Office, L-315.
The important graduation deadlines can be found here: Academic Calendars | Graduate Medical Sciences.

As completion of the dissertation nears, time will be set for the student to present material included in the dissertation at a Departmental seminar. Arrangement of the seminar requires approval of the first and second readers. The DEC will also attend the seminar, and after a suitable time has been allowed for the members of the Department of Anatomy & Neurobiology and others in attendance to comment and/or ask questions, the

student and the DEC will proceed with the formal oral defense of the thesis.

The Chairperson of the DEC will lead the formal oral defense. The defense is open to any faculty member of the School of Medicine. Committee members will be allowed time to ask the student questions about their research. When voting committee members have completed their questioning and/or when the Chairperson feels that the formal oral defense should be concluded, the student will be asked to wait in a nearby room while the committee members vote. The student will then be called back into the oral defense room and informed of the committee's decision. If corrections to the dissertation are required, then a timeline for making these corrections will be outlined by the Committee Chairperson. No more than one "Fail" vote will be allowed for the student to receive a "Pass" of the oral defense.

If the student fails the oral defense of the dissertation, then the committee will recommend a remedial course of action, which must be approved by the Graduate Education Committee.

One bound copy of the final thesis must be provided by the student for the Anatomy & Neurobiology Department's library. Students have traditionally also provided each member of their committee with a bound copy and should check with their committee members to determine whether these additional copies will be required.

Acme Binding is a recommended vendor for binding services. They accept submission of orders electronically, or at their Charlestown, MA location.

More information can be found on their website: Thesis & Dissertation Binding

G. Teaching Requirements for Doctoral Candidates

PhD candidates are required to complete 160 hours of teaching.

Each year the student will be given the opportunity to request their top three teaching choices at the Annual Student Review. The Graduate Education Committee will then review all requests and, in consultation with Course Directors, will determine teaching fellow assignments based on student seniority, student choice, and other matters that impact student coursework/thesis writing. The Graduate Education Committee will do their best to match students with their preferred teaching assignment. The Graduate Education Committee makes the final decision regarding teaching assignments.

The following Departmental courses are available for graduate student teaching assignments. As shown, each course has a specific number of hours allocated to it.

- Cellular Organization of Tissues – 90 hours
- Human Gross Anatomy – 40 hours per section
- Anatomy for Dental students – 40 hours per section
- Systems Neurobiology – 80 hours

- Cognitive Neuroscience – 40 hours
- Methods in Neuroscience – 20-40 hours per section
- Cell & Molecular Neurobiology – 40-80 hours
- Neuroanatomy Through Clinical Cases – 40-80 hours (half or full semester commitment)
- Graduate Histology – 40 hours
- Medical Gross Anatomy – TBD

The teaching responsibilities in each course are determined by the Course Directors and may vary among the courses (see Appendix for outlines of requirements for each course).

H. Assessment of Doctoral Candidate Progress

During the spring of each academic year, the student and their advisor will meet with the Graduate Education Committee (GEC) in the Annual Student Review. The review is a forum for the student to highlight and explain their academic, research, teaching, and service accomplishments over the past year, and to detail plans for the coming year. This meeting also allows for direct oversight of the Committee on the timely progression of each student through their degree program, and to maintain the academic, research, and professional standards of the Department, and it serves as an environment in which students may ask questions or voice concerns.

Prior to the meeting, each student will submit a form to the GEC that details the past year's coursework, research performance, teaching performance, and service. The student should fill this form out in conjunction with his or her advisor prior to submitting it to the Committee; at the very least, the student and advisor should have a meeting prior to the annual review to discuss past academic and research performance, achievement of goals, future or modified goals. The advisor should plan to attend the meeting with the student, if at all possible.

The format of the annual meeting typically begins with the student presenting their activities over the previous year, and the committee will ask questions as needed. To that end, having a short statement prepared as to the events of the previous year and plans for the coming year is useful. The student should be prepared to answer the following questions (as appropriate):

1. What progress was made in the previous year with respect to:
    a. course requirements
    b. research progress
    c. professional development
    d. service
2. If performance in class, or in research did not fulfill expectations of the student, advisor or committee, what will be done in the future to ensure expectations are met?
3. What are the goals of the student in the coming year for courses; research progress; professional development; and service?
    a. What is the timeline for completion of the program and what are the student's future plans?
4. What are the goals of the student in the coming year for
    a. courses
    b. research progress
    c. professional development
    d. service
5. What is the timeline for completion of the program and what are the student's future plans?

Teaching assignments for the next academic year will also be discussed; however, student teaching assignments are typically not finalized at this meeting.

I. Department and Graduate Student Seminars and Journal Club

- Graduate student attendance at all Departmental Seminars is mandatory. The only exception to this requirement is when attendance at a seminar conflicts with attendance at a course taken for credit.
- Members of the Raviola Memorial Seminar Student Committee will arrange a seminar and related events in tandem with Department administrative staff once per year.
- Post-qualifying students are required to give a departmental seminar at least once a year, except in the academic year in which students plan on defending their dissertation.
- All graduate students in the Department of Anatomy & Neurobiology are required to complete two credits of Journal Club (GMS AN 801/802). Thereafter students must continue to enroll in a Journal Club section once per year, but no academic credit will be given, except in the academic year in which students plan on defending their dissertation.

J. Graduate Education Committee (GEC)

The GEC directs and oversees the graduate programs within the Department of Anatomy & Neurobiology. Its responsibilities include, but are not limited to: admissions decisions, policy-making, the establishment of academic requirements, the resolution of disputes, and advice on the administration of programs (e.g. training grants) affecting graduate students. The Committee is chaired by the Graduate Programs Director and includes a minimum of three other faculty members and the Department Chairperson (ad hoc).

The Graduate Director or other member of the GEC will advise students on the choice of courses to be taken prior to the student selecting a primary research advisor.

The GEC has the power to dismiss students for reasons of academic underachievement, poor conduct, or lack of professionalism. The decision to dismiss a student is made by the Graduate Education Committee. The student may appeal a decision of dismissal to the Chair of the Department and/ or the Ombuds who presents the student's case to the GEC.

K. Department Graduate Student Organization

During the first month of the academic year, all the Department Graduate Students will be responsible for: (1) recommending an Ombuds, (2) planning the annual Raviola seminar and reception, (3) selecting representatives to designated Department Committees (4) selecting their graduate student representatives, who act as the primary spokespersons for graduate student concerns and 5) scheduling the annual 20-minute research updates by PhD candidates to the department (Thursdays at 2 pm).

L. Ombuds

A member of the Department will be selected to serve as Ombuds; in this role, the faculty member will mediate any dispute or hear any concerns from those who wish to discuss an issue outside of the normal administrative structure of the Department. Interactions with the Ombuds will be held in confidence, unless requested by the student or if there is a safety concern. The Ombuds will be selected by the Graduate Students on an annual basis; students must inform the GEC of the selection.

M. Miscellaneous

1. Tutoring, Extramural Teaching or Other Employment

Students may participate in tutoring or extramural teaching with written permission from their advisor. When undertaken, such activities should not exceed six hours per working week. Additionally, should such activities be undertaken, NIH guidelines require that all PhD candidates participate in research activities for at least 40 hours per week. Excessive activities outside the doctoral program are discouraged, as they may impair the student's successful pursuit of a doctoral degree. International students need to check with the ISSO (International Student and Scholar Office) and must comply with all immigration and visa requirements.

2. Vacations and Leaves of Absence

In addition to the standard GMS holidays and intersession dates, students are entitled to a two week vacation period. The timing and length of the vacation period shall be approved by the student's advisor. Normally, students should expect to engage in research during the summer months and the period between winter intersession and the start of courses. Spring break is not observed for graduate students.

The Bulletin of the Division of Graduate Medical Sciences, under Academic Policies and Procedures, describes the procedures involved with Leaves of Absence.

Additional Considerations for MD/PhD Candidates

Overview of the MD /PhD Program

Candidates in the MD/PhD program must be accepted into the PhD portion of the program by the GEC in the Department of Anatomy & Neurobiology. This acceptance can take place either when the student first applies for entry into the joint program, or it can occur after the student has entered the program and is undertaking the first two years of the Medical School program for MD students. In the latter instance, the research advisor with whom the student is proposing to undertake their dissertation research should apply in writing to the Graduate Education Committee to have the student accepted into the Departmental PhD Program.

Although MD/PhD students generally follow all the requirements expected of PhD candidates (the same or similar required courses and 160 hours of teaching), there are a few additional considerations. MD/PhD students should be aware of the following to make the research years productive and minimize problems that may be encountered during the transitions from Medical School to Graduate School and vice versa.

MD/PhD students are on an extremely tight schedule if they want to take all required courses and exams,

finish their research, write their dissertation, and defend their thesis in the three years suggested for MD/PhD students. The student should understand that the three years is generally a minimum, and many MD/PhD students actually take three and a half to four years (or more) to complete their dissertation projects. They should carefully plan and budget time wisely to make the most efficient use of their graduate school years.

The MD/PhD students receive Pass (P) or Fail (F) grades like any other medical student for the first two years. Only Pass (P) grades are acceptable in lieu of Graduate School grades. During the graduate years, they will receive letter grades for all courses taken for credit as do all PhD students.

The transition from Medical School to Graduate School generally occurs without too much difficulty. Most problems are logistical and relatively minor. For example, the student needs to make sure that the school mail gets forward from the BUSM mailroom to the Department. However, the transition back to medical school takes a little more effort to make sure that it goes smoothly. In the Spring of their last year in Graduate School, the student needs to inform the Medical School registrar's office that they will be returning to medical school for rotations. It is also necessary to check that all Division of Graduate Medical Sciences requirements have been completed before returning to clinical rotations to avoid complications when obtaining both degrees at graduation. There are special clinical skill review courses for MD/PhD students to aid the transition. All of this information and other general requirements and expectations for MD/PhD students are described in detail in the Division of Graduate Medical Sciences.

MD/PhD students are expected to complete a total of 28 required credits as part of the PhD component of the degree, in addition to their medical school credits. Students are engaged in the typical first- and second-year PhD curriculum, excluding GMS AN 719 (Human Gross Anatomy, 6cr) and GMS AN 726 (Graduate Histology, 4cr). MD/PhD students typically fulfill many of the required courses during their first year. Those who have joined a lab and have a project may elect to take their Qualifying exam in the first year while others wait until their second year to take the exam.

Appendix

Graduation Checklist

Please note: PhD students must have 64 graduate credits of coursework and research in order to graduate. Additionally, all PhD students must sign up for 12 credits of research credits or a certified full-time form (if graduating in the summer) the semester they graduate:

- GMS AN 901 (fall) and GMS AN 902 (spring)

Submission of a certified full-time form and checking the second box automatically registers students for the following:

- MS985S A1 (Summer 1)
- MS986S B1 (Summer 2)

9 to 12 months prior to defense

- Submit Prospectus to GEC, GMS Division
- Submit names of Thesis committee for final approval to GEC

3 months prior to defense

- Complete diploma application and submitted to GMS
- Thesis completed and submitted to thesis committee

1 month prior to defense

- Dissertation Abstract form submitted to GMS, GEC
- Oral Final Exam Schedule for submitted to GMS, GEC
- Special Service form submitted to GMS, GEC

2 weeks prior to defense (at the very latest)

- Final pre-defense meeting (written thesis must be completed prior to meeting and committee members given time for evaluation)
- Defense

After Defense

- Written thesis with signed signature pages submitted to the Division of GMS by appropriate due date.

Teaching Fellow Expectations

The following was prepared by the Course Directors to describe the requirements and expectations for graduate students serving as Teaching Fellows (TF) in their respective courses. Please contact the Course Director if you have any specific questions or concerns.

GMS AN 719 Human Gross Anatomy, Course Director: Linda Afifi (lafifi@bu.edu)

Responsibilities for each unit would include the following:
1. Attend, teach, facilitate dissection during scheduled lab hours
2. Conduct 2 x 45minute exam review sessions on lab content
3. Prosection of TA designated donor ahead of scheduled lab times
4. Prosection of student designated donors (n=3) to help facilitate dissections before lab (i.e, skinning, thoracotomy, hemisecting, creating skin flaps, reflections etc.)
5. Assist with practical exam set-up (2 hours)

Unit 1 Back & Limbs
Unit 2 Thorax, Abdomen, Pelvis
Unit 3 Head & Neck

GMS AN 725 Neuroanatomy through Clinical Cases, Course Director: Elizabeth Whitney (ewhitney@bu.edu)

Responsibilities:
Assist students during lab sessions: 1.5 hrs/week
Weekly office hours: 1.5 hrs/week
Weekly homework: review student submission for completion only
Write 3-5 practice questions/wk

[Course number TBD] Principles Integrating Science, Clinical Medicine and Equity(PISCEs), Anatomy Thread Director: Jonathan Wisco (jjwisco@bu.edu)

Objectives:
Anatomy and Neurobiology Graduate Student TA's will learn best practices for teaching and learning in a multi-disciplinary environment, develop instructional materials and review content, and teach in the medical school PISCEs modules. Teaching opportunities include in lab-style learning environments, and in-person and Zoom recitation sessions. Students can repeat their teaching experiences in 4-week or 2-week time periods, to cover different content teaching experiences. If interested, medical education scholarly opportunities are available.

Prosection and Teaching (exact dates are subject to change)
2nd and 3rd weeks in July (Block 10)
Cadaver prosection of thorax, abdomen, pelvis; head and neck; and back and limbs during the Anatomy and Ultrasound Medical Educator Fellowship
4th week in August, 1st-3rd weeks in September (Blocks 12 and 13)
M1 student teaching, and some cadaver prosection in Foundations 2
Week 1: Neuroanatomy
Week 2: Thorax
Week 3: Abdomen
Week 4: Pelvis

2nd-4th weeks in October (Blocks 13 and 14)
M2 student teaching, and some cadaver prosection in Dermatology/Rheumatology/Musculoskeletal System (DRMSK)
Week 1: Upper extremity
Week 2: Lower extremity
Week 3: Neck and Back

2nd week in November (Block 15)
M2 student teaching, and some cadaver prosection in Head and Neck Integration
Week 1: Head and Neck

In each anatomy-related PISCEs week above, there are two anatomy labs, which will be semi-guided prosections based on the dissections that were completed in July. Expect that final dissection clean-up will be necessary in preparation for labs. Each PISCEs module is split into 2-week sub-modules. The anatomy assessments will include weekly Team-Based Learning (TBL) individual and group readiness assurance tests (iRAT/gRAT), and a shortened practical exam with written exams that include all sub-module content.

Learning Best Practices for Teaching and Learning
Each week students are required to complete readings and reflections on best practices for teaching and learning and will meet with the Course director to correlate teaching activities.

GMS AN 726 Graduate histology, Course Director: Maryann MacNeil (mamst@bu.edu)

This course will focus primarily on the histology (microscopic structure and function) of cells and tissues of the body. The Teaching Fellow will assist students with the application of skills based on visual learning. The TF will guide students through tissue sections using our online virtual microscopy system, Biolucida. This will require a solid understanding of the lecture material that precedes the laboratory sections.
TF is responsible for:
Attending lab and guiding students through laboratory materials (11 labs=22 hours)
Writing practice questions for each lecture. 14 total at approximately 1 to 1.5 hours per week

GMS AN 722 Cellular Organization of Tissues, Course Director: Louis Toth, PhD (ljtoth@bu.edu)

As per LCME guidelines for Teaching Fellows (TFs) in medical courses, our TFs must be familiar with the educational objectives of the course, and be prepared to teach and evaluate the students. TFs for histology are responsible for supporting the learning of the students in the course. Their prime responsibilities are: (1) to know the material and how we are teaching it (2) to facilitate the learning of the students and (3) to aid the faculty in the administration of the course.

Qualifications for TFs: TFs must have performed well in the BUSM histology course in a recent term. (Grade of B+ or better and permission of the course director are required.)
Duties of TFs:

1. TFs are responsible for reviewing the material and having the necessary understanding to teach it. They are encouraged to attend the course lectures and expected to spend time each week reviewing their notes and the textbooks prior to the scheduled staff meetings. They are responsible for attending all meetings of the course faculty, in which we discuss the quizzes and the teaching strategy for the labs and discussions. The faculty may provide TF review sessions for the explicit purpose of reviewing course material, and discussing

the progress of students. TFs meet once before the beginning of the course to review the course objectives, and to receive guidance about their roles in the teaching and evaluation of students.

2. Tutoring takes place mainly in TF office hours, scheduled at a regular time at the TF's discretion, but usually the day before each discussion and with sensitivity to the course schedules of all students in the course (GMS and pathway). TFs are also expected to help faculty guide individual students one-on-one during discussion sessions as planned. TFs are expected to provide some outside assistance (within limits) for the students in their lab, and are encouraged (but not required) to join the ranks of official paid tutors for the course.
3. TFs assist with running of the discussion sessions, including learning and using the teaching technologies. These currently include lights & projector, SMART Sync, SMART Tools, TurningPoint Responseware, and BACUS Virtual Microscopy. TFs attend an orientation session at the beginning of the semester in which the use of these technologies is demonstrated. TFs assist on examination days with enforcing proper conduct of the students, and with simple, procedural questions including computer issues. Currently, these involve knowing the test administration procedures of Blackboard-8 and SofTest by ExamSoft. TFs are NOT responsible for creating or checking the content of the course exams

Assessment of TFs:

The performance of the TFs will be assessed through (1) observation by faculty throughout the course, (2) a written performance evaluation at the conclusion of the course, and (3) student-written evaluations included in the students' end-of-course feedback.

Summary of time commitment:

TF Hours	AN722 (Fall Term)
Labs	3 hrs/week
Exams	5 hrs/exam x 2 exams
Office Hours	2 hrs/week
Staff Meetings	1 hr every week
Preparation	as needed

GMS AN 718 Methods in Neuroscience, Course Directors: Jean-Jacques Soghomonian, PhD (jjsogho@bu.edu) & Jeannine Foley, PhD (jeannine@bu.edu)

This course consists of five modules that span 2.5 weeks (5 lectures total). One TF will be assigned per module and will become a 'content expert' in their chosen field (TFs may sign up for multiple modules if space allows). TFs in the course are expected to attend each lecture within their module and read the assigned content for that module. Research beyond assigned material may be necessary. TFs will prepare one discussion question per lecture and facilitate classroom discussion. TFs will also be expected to correct a semi-weekly assignment pertaining to each lecture and/or assigned reading and provide feedback to the students about the quality of their work.

Module 1: Behavior
Module 2: Anatomical/histological Methods
Module 3: Foundations in Molecular Methods
Module 4: Analyzing Neuronal Circuits
Module 5: Analyzing Neuron Activity

GMS AN 810 Systems Neuroscience Course Director: Doug Rosene, PhD (drosene@bu.edu)

1. Attend lectures and discussions for the four hours of class over the 15 weeks of the semester. (Estimated total of ~60 hours for the semester.)
2. Read and grade the weekly two-page, double-spaced papers that are a summary and critique of an assigned research article - total of about 15 papers for each of 15 weeks. This requires reading and if necessary, researching the assigned paper. (Estimate of up to 12 hours per week for 15 weeks = ~ 180 hours for the semester.)
3. Grade a variable number of weekly quizzes – short answer, 5 questions. (Estimated total of ~30 hours for the semester.)
4. Meet with students as needed and participate in evaluating discussion performance and assigning final grades. (Estimated total of ~10 hours for the semester.)
5. Total number of hours over 15 weeks of the semester will be up ~ 280 hours or an average of ~18 hours per week

GMS AN 811 A1 Cognitive Neuroscience
Course Directors: Karin Schon, PhD (kschon@bu.edu) and Robert Joseph, PhD (rmjoseph@bu.edu)

This course meets on both the Charles River and Medical campuses, and generally has two teaching fellows, one from each campus. TFs are expected to attend two-course lectures per week (4.5 hours total) and hold weekly office hours. On days that laboratories are held in lieu of a lecture, TFs will assist the laboratory manager in setting up testing rooms, supervising data collection, and compiling the data for distribution.

Please note TFs should meet with the lab manager a day or two before the lab to run through the experiments.

Students will submit weekly lab reports, and TFs are expected to collect these reports, grade them in coordination with the instructors and return them to the students within 1 week's time. TFs will use Blackboard to post announcements, class materials, and grades.

MD-511 Anatomical Sciences-II, Dental Gross Anatomy Course Director: Elizabeth Whitney, PhD (ewhitney@bu.edu)

Graduate teaching fellows (TFs) in the Dental Gross Anatomy course will have the opportunity to perform cadaver dissection and present their dissection to small groups of first-year dental students. TFs will organize their own laboratory dissection presentation(s) and will present this to faculty in the days prior to the scheduled laboratory. Faculty will mentor TFs through this process to ensure that all presentations are clear and accurate. In the week preceding each examination, TFs will give review sessions in the laboratory. TFs will also participate in setting up and administering the practical examinations.

Example #1: *
- Lab 1: Thoracic wall, mediastinum, pleural cavities, heart, lungs, diaphragm
- Lab 2: Anterior abdominal wall and abdominal organs

- Practice Practical: Practice practical set-up (morning)
- Practical Exam 1: Practical examination set-up (morning); Proctor exam (afternoon)
- Review Sessions: 3 sessions x 1 hour

Example #2: *
- Lab 3: Structures of the neck
- Lab 4: Axilla/ brachium
- Practical Exam 2: Practical examination set-up (morning); Proctor exam (afternoon)
- Review Sessions: 3 sessions x 1 hour

Example #3: *
- Lab 5: Face, parotid region, suprahyoid region
- Lab 6: Temporal/ infratemporal fossa, retropharyngeal space, cranial contents
- Lab 7: Pterygopalatine fossa, nasal and oral cavities, pharynx, larynx, and self-study of larynx on models
- Practical Exam 3: Practical examination set-up (morning)
- Review Sessions: 3 sessions x 1 hour

* Note: The above are examples only.

GMS AN 777 Fundamentals of Cellular and Molecular Neuroscience, Course Director: Ella Zeldich, PhD (ezeldich@bu.edu)

Responsibilities for TFs would include the following:
- TFs are required to take AN777 themselves as a prerequisite for the position.
- TFs are encouraged to attend the course lectures and review the material.
- TFs are required to read all the articles, attend all the discussions, and actively help with facilitation of the discussions. This might require researching the assigned paper, if necessary. About 12-15 articles will be discussed per semester.
- TFs are required to review and grade 3 quizzes (multiple choices) through the course of the semester (Estimated total of ~12 hours for the semester).
- TFs might be asked to help with reviewing 2 to 3 questions out 8 in a midterm exam. (Estimated total of ~5-6 hours for the semester).
- TFs are expected to provide occasional help for students that might face difficulties and need guidance in addition to the office hours that the course director will be providing.
- Meeting with the course director for the grade discussions are expected (Estimated total of ~10 hours for the semester.)

Student Committee Position Descriptions

Graduate students are encouraged to participate in service activities within and outside of the department. Some potential opportunities include:

Graduate Medical Science Student Organization (GMSSO):

Members will attend monthly meetings to organize events for graduate students on the medical campus.

Newsletter:
This group of students will gather articles from faculty, staff, and students to present in a newsletter form about the recent news of the department. Articles typically include recently awarded grants, new students and/or faculty, conference updates, recent publications, presentations, and a report from the chairman.

Mentors:
A mentor is typically a student who has been in the department for two or more years. Mentors may be paired with one or more students. Their primary role is to provide mentees with basic information and to answer any questions a new student may have.

Raviola Memorial Seminar:
Dr. Raviola was an outstanding scientist and faculty member in our department. In her honor, each year, a group of graduate students nominates a speaker (typically within the field of vision) and organizes the day's events. Typically there is a time to meet with faculty, lunch with students, and a reception following the seminar.

Social Committee:
Students organize social gatherings for the graduate students of the department. This is in order to "get-to-know" each other outside of the classroom. In the past, events have included movies, bowling and game nights.

Student Representatives:
It is the responsibility of these two students to organize the graduate students and report to the faculty any issues that may have come up.

Important Dates:

For GMS academic calendars please visit: Semester Dates | Office of the University Registrar

Note that since some classes are in the Medical School, some of the GMS dates do not apply if you are taking a medical school course.

For Medical school academic calendars (BUSMI) please visit: Academic Calendars | School of Medicine

Resources

Getting Around Town

"The BUS", is a free shuttle running between the medical and Charles River campuses (runs every ½ hour during the academic year, every 12 minutes during rush hour). You can find a detailed schedule at:
Shuttle and on the "Terrier Transit" App.

The following links provide information about bus passes, public transportation and parking:
Fall MBTA Student Semester Pass » Parking & Transportation Services | Boston University
Bus | Schedules & Maps | MBTA
Parking & Transportation Services

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Parking & Transportation Services

Public Safety
The BUMC Public Safety Department is staffed 24 hours a day, seven days a week. There is one Command and Control Center located at 750 Albany Street. Service calls for security, facilities, and emergency response are dispatched from this location and can be reached at (617) 358-4444.

Contact the Command and Control Center to report suspicious and unusual activity. The Public Safety Desk Officer will dispatch an officer to respond to the problem immediately.

Incident Reports
The Public Safety Department encourages all employees and students to report suspicious behavior and/or criminal activity to the Command and Control Center at (617) 358-3998 as soon as possible. The Public Safety Department will document all reported incidents and forward those in need of further investigation to the department's Investigations Unit. Public Safety Department incident reports are the confidential properties of BUMC, and copies will only be released with the approval of the Office of General Counsel. Requests for copies of Public Safety Department incident reports should be directed to Public Safety Administration at (617) 414-4413.

Lost and Found
The Public Safety Department documents and maintains custody of all recovered property at the medical center. Please contact the Command and Control Center at (617) 358-3998 if you find property. An Officer will be dispatched to secure the property and attempt to return it to its owner. In the event that you should lose or misplace property or if property is stolen from you, please contact the Command and Control Center at (617) 358-3998 to report the loss. The Desk Officer will dispatch an officer to meet you and document your loss if necessary.

Public Safety Escorts
The Public Safety Department will provide vehicular or pedestrian escorts to the garages, lots, and surrounding medical center buildings during night and weekend hours upon request. Escorts are subject to availability by calling the Command and Control Center at (617) 358-3998. The Public Safety Department recommends that you utilize the shuttle services available to you that transport to the garages, lots, surrounding medical center buildings, and authorized MBTA stops. Click the shuttle services index for more detailed information.

Emergency Call Boxes
The Public Safety Department has installed emergency call boxes at a variety of locations within and around the perimeter of the medical center. Emergency call boxes are blue metal boxes that are easily identifiable by blue lights located above the box. These call boxes contain auto-dial phones that connect the caller to the Command and Control Center once the emergency button is pushed. These phones should be used in emergencies only and

automatically disconnect after 3 minutes. The location of the call will automatically be sent to the Command and Control Center for dispatch and response purposes.

Identification Cards
The Public Safety Department maintains a photographic database of all employees, faculty, and students. Identification cards are to be worn at all times while on medical center property. For those who require access to restricted areas, a combined Photo Identification/Access Control card is issued. The Public Safety Department issues Identification / Access Control cards in the ID office, located on the first floor of 650 Albany Street. The ID office is on the right when you enter the lobby. You may obtain a badge Monday through Friday, 7:00 am to 3:00 pm. The office will be closed for morning break from 9:00 am-9:15 am, and lunch break is from 12:00 pm-12:30 pm. For more information, you may call (617) 638-6879.

There is a $35.00 replacement charge for lost photo IDs/access cards. Please go to the cashier's office at 88 East Newton St. 2nd floor to make payment before reporting to the ID office for a replacement ID.

The Control Center
The Control Center is responsible for monitoring all building automation systems and dispatching staff to respond to requests for assistance including fire alarms, heating/air conditioning systems issues, and all other building and grounds issues at the medical center. A Control Center Technician is on duty 24 hours a day, 7 days a week and is responsible for ensuring that there are no interruptions in building services or utilities that will impact the operations of the medical center. The phone number is 617-358-4144. Employees and students should immediately report all facility-related deficiencies to the technician on duty. Fire, smoke, chemical, or radioactive spills should be immediately reported to the Control Center's emergency response number: (617) 414-6666.