

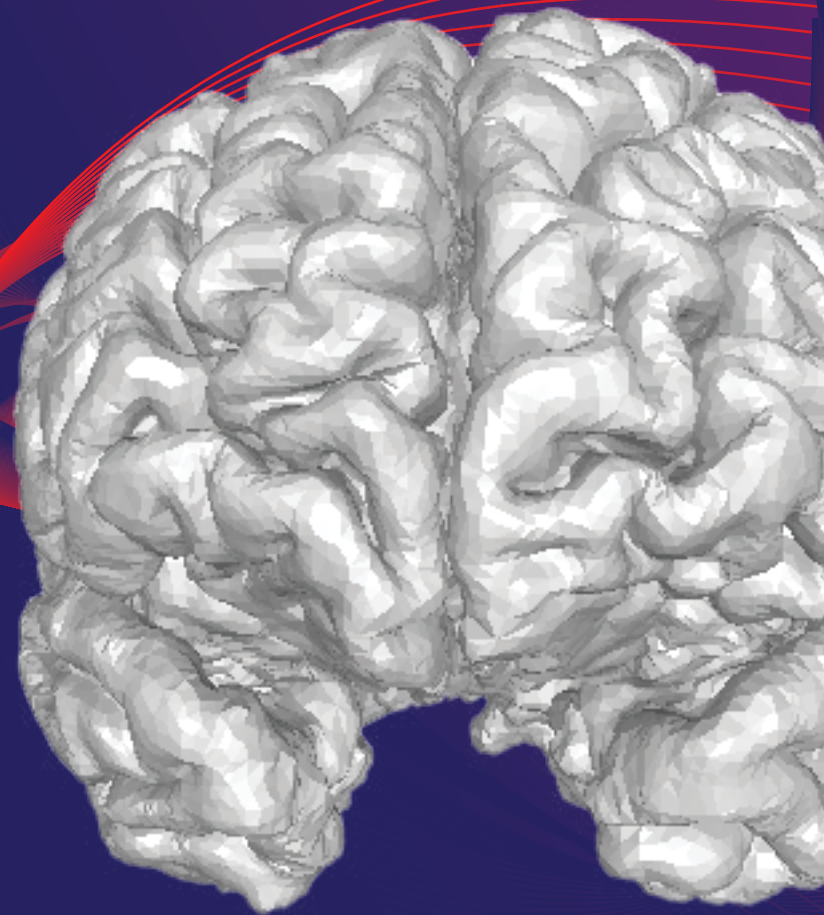


Boston University School of Medicine
Department of Anatomy & Neurobiology

Department of Anatomy & Neurobiology

Boston University School of Medicine

**Master of Science in
Anatomy & Neurobiology**



2021 - 2022 Program Guidelines



Contact Information:

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Departmental Resource Matrix

Maria Medalla, PhD PhD Advisor mmedalla@bu.edu	-Questions regarding program requirements -Troubleshooting enrollment and GMS requirements -Academic, career, and research advice, PhD students
Ann Zumwalt, PhD Graduate Program Director azumwalt@bu.edu	-Questions regarding program requirements -Troubleshooting enrollment and GMS requirements -GEC Chair
Linda Afifi, PhD Masters Student Advisor lafifi@bu.edu	-Academic advising, MS students -Research and career advice, MS students
Melisa Kelly Administrative Manager mae@bu.edu	-General Administrative and procedural questions -Stipends
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All students should familiarize themselves with the general policies of the Division of Graduate Medical Sciences as well as the program-specific requirements for the Anatomy & Neurobiology Vesalius Program found within this document. Supplement to Boston University Division of Graduate Medical Sciences Guidebook. (<http://www.bumc.bu.edu/gms/students/policies-procedures-handbook/>)



Guide for Master Student Candidates

A. Overview of the MS Program

The MS degree in Anatomy & Neurobiology is a rigorous full-time, two-year program that incorporates anatomical and neurobiological principles coursework. In addition, the degree has a strong focus on training outstanding educators through a combination of coursework and one-on-one mentoring. The program also requires the acquisition of scientific and scholarly expertise through the generation of a Masters research thesis.

The program for the MS degree consists of the equivalent of one year of foundational course work and one year of directly supervised research work. Candidates are required to complete 32 credits at the graduate level. Course selection for the MS program is done in consultation with your academic advisor.

By the end of their first year of study, Masters degree students will be expected to identify a research advisor from among the Department’s faculty and spend the first summer occupied with scientific research. This faculty member will then advise the student on which courses should be taken in the second year of their training.

The research work and the results obtained will be presented as a written thesis at the end of the MS program. This should be comparable in design and content to a full-length article in a scientific journal. The MS program has a maximum time limit of three years after initial registration into the program.

B. Course Requirements for the MS Degree

Required Courses (28-32 credits)

- Medical Gross Anatomy.....8 Cr AN 701
- Medical Neuroscience4 Cr MS 703
- Exptl. Design & Statistical Methods or Elementary Biostatistics.....2 Cr AN 704/MS 700
- Vesalius 1: Teaching in the Biomedical Sciences.....2 Cr AN 806
- Vesalius 2: Applied Teaching in the Biomedical Sciences.....2 Cr AN 809
- Vesalius 3: Teaching practicum in the biomedical sciences.....2 Cr AN 805
- Research Colloquium (Journal Club).....2 Cr AN 801/AN 802
- Professional Skills.....2 Cr AN 715
- One Departmental Elective Course (see list below).....2-4 Cr

Elective Course Options*

Courses typically offered in the Fall Semester

- Advanced Human Osteology.....4 Cr FA 806
- Biomedical Imaging Foundations.....4 Cr IM 600
- Cells, Organs and Tissues (Histology).....4 Cr AN 722
- Forensic Biology.....3 Cr FS 702
- Forensic Pathology.....3 Cr FS 712
- Fundamentals of Cell & Molecular Neurobiology.....4 Cr AN 777
- Human Anatomy and Osteology.....4 Cr FA 712
- Molecular Biology of Forensic DNA.....3 Cr FS 720
- Scientific Writing.....2 Cr AN 815
- Systems Neurobiology.....4 Cr AN 810

Courses typically offered in the Spring Semester

- Advanced Clinical Anatomy.....2 Cr AN 708
- Advanced Neuroanatomy (even-numbered years).....4 Cr AN 724
- Cognitive Neuroscience (on-demand*).....4 Cr AN 811
- Developmental Cognitive Neuroscience (on-demand*).....4 Cr AN 716
- Dynamic Modeling.....2 Cr AN 820
- Learning and Memory (even-numbered years).....2 Cr AN 702
- Methods of Functional Imaging of the Brain.....2 Cr IM 630
- Methods in Neuroscience.....4 Cr AN 718
- Molecular Basis of Neurologic Disease.....2 Cr MS 783
- Neurobiology of Aging (odd-numbered years).....2 Cr AN 707
- Neurobiology of the Visual System (on-demand*).....2 Cr AN 807
- Graduate Histology (odd-numbered years).....2 Cr AN 824

**(includes courses from programs in Forensic Science [FS]; Forensic Anthropology [FA] and Imaging [IM])*

**Many courses are only offered when requested by 5 students or more.*

Requirements for the Vesalius Module:

All Masters degree students complete the Vesalius Module. Masters students must have successfully completed these prerequisite courses to pursue the Vesalius Module:

- Medical Gross Anatomy 8 Cr AN 701
- Medical Neuroscience 4 Cr MS 703

The module consists of three courses/components. The program begins with a course on the development of teaching skills in the biomedical sciences. This is followed by a teaching apprenticeship (service as a teaching fellow in one or more of the medical or graduate required courses above), and concludes with a Mentored Teaching Project that involves the development of a didactic lesson or exercise under the direct mentorship of experienced and 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

Typical curriculum for Masters in Anatomy & Neurobiology students:



Year 1: Fall

Medical Gross Anatomy.....	8 Cr	AN 701
Medical Neuroscience	4 Cr	MS 703

Year 1: Spring

Vesalius 1: Teaching in the Biomedical Sciences.....	2 Cr	AN 806
Professional Skills for Students in the Biomedical Sciences.....	2 Cr	AN 715
Elective (see list above).....	2 Cr	
Research Colloquium (Journal Club).....	2 Cr	AN 801/802
An approved statistics course (may also do this in Year 2).....	2-3 Cr	

**Early in the spring semester, students will identify a research lab and mentor with whom they will do their research thesis. It is expected that students will spend a minimum of 4 hours in the lab per week until June, when they transition to full-time in the lab. Students must commit a combined 40 hours/week of coursework and lab work, where each credit hour of coursework is considered to be 3 hours/week.*

Year 2: Fall-Spring

During Year 2 students must take:

An approved statistics course.....	2 Cr	
Vesalius 2: Teaching Apprenticeship.....	2 Cr	AN 809
Vesalius 3: Teaching Practicum.....	2 Cr	AN 805
Research.....	Variable	
Electives as desired (see list above).....	Variable	

Students may petition the Graduate Education Committee (GEC) for certain exemptions from these requirements. Materials should be submitted with the petition letter before the time of registration to the Graduate Program Director.

1. If it is deemed that an equivalent and appropriate graduate-level course has been successfully completed in the preceding three years, the student may petition the GEC to be exempt from the course. The syllabus of the proposed course should be submitted with a written petition. If the petition is approved, then the course may be substituted for another course.
2. Students must petition the GEC for permission to take courses outside the standard curriculum.

1. Grades

To receive credit in any course taken as part of the MS degree program, students must receive a B- grade or better. Fulfillment of this academic level places a student in good academic standing. A grade of C+ or lower is considered a failure (F). If there is a failure in one of the basic departmental required courses then the student is no longer in good academic standing, and this course must be remediated in a manner that is deemed appropriate by the GEC.

When the work of a course has not been completed within the semester of registration, the grade of I (Incomplete) may be given at the discretion of the instructor and depending on the reason for incomplete work. This automatically becomes a permanent grade of I (unsatisfactory grade) 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 (fail).

2. Teaching

Teaching is an essential part of our MS Degree Program. MS candidates complete 40 hours of teaching under the rubric of the Teaching Apprenticeship (AN 809). This requirement is typically fulfilled during the second year of study.

Each year the student will be given the opportunity to request his/her top teaching apprenticeship choices. The GEC will then review all requests and, in consultation with course directors, will determine teaching assignments based on student seniority, student choice, and other matters that impact student coursework/thesis writing. The GEC will make every effort to match a student with his/her preferred teaching assignment. The GEC makes the final decision regarding teaching assignments. .

The following Departmental courses are commonly requested for graduate student teaching assignments.

- One section of Medical Gross Anatomy
- One section of Anatomy for Dental students
- Medical Neuroscience

Students may opt to teach in other courses and may express their preference to the GEC. Prior to this request, students should have spoken with the Course Director of their chosen course to assess availability/feasibility.

3. Academic Probation

If a student receives a grade of C+ or lower in any course, the student will be notified in writing that they have been placed on Academic Probation. Students in danger of failure in any course will be identified, and a plan for improving their grades will be generated. Students on Academic Probation must meet with their advisor to develop a plan for academic improvement and remediation of relevant coursework (when allowed). Students on Academic Probation must receive grades of B- or higher in all coursework in subsequent semesters. If this condition is not met, the student is at risk for dismissal from the program.

The following regulations and restrictions will apply during the probationary period:

- The student is required to meet with the Graduate Program Director in order to assess progress prior to the start of the ensuing semester, and again before the deadline to drop a course with a "W." It is the responsibility of the student to initiate these meetings.
- The student must prioritize registration for core courses that are offered during the probationary period; registration of elective courses is an option only when all the core courses are not offered in that semester, have been completed, or are in progress.

4. Academic Dismissal

Upon receiving written notice of dismissal, students may appeal this decision to the Associate Provost of GMS, per GMS guidelines.



C. Research Requirements for the MS Degree

1. Overview of Research Requirements

Scientific research in the Department of Anatomy & Neurobiology will focus on advancing knowledge in the fields of anatomy and/or neurobiology. Anatomical and/or neurobiological research must be the principal focus of the Masters thesis; however, a student may include education research as a complementary component of the thesis.

All MS degree students will participate in scientific laboratory research. Students are encouraged to spend as much time as possible in a research laboratory during the second semester of the first year of study. Students should plan their first research rotation during the month of January before courses begin. Students must engage in a minimum combined 40 hours/week of coursework and lab work.

At the end of the first year, students are encouraged to finalize the choice of laboratory in which their thesis project will be performed. Students are expected to engage in full-time research during the summer after the first year. In the second year, students should aim to carry out full-time research, complete other requirements for their degree, and engage in teaching activities.

MS candidates are strongly encouraged to present their research at the annual Henry I. Russek Student Achievement Day at the end of their second year. Students are also encouraged to consider presenting their Vesalius Teaching Practicum projects at the annual John McCahan Education Day.

2. Primary Research Advisor

During the time the student does not have a primary research advisor, the Masters Advisor (Dr. Afifi) and Graduate Director (Dr. Zumwalt) will advise students on the choice of courses to be taken. Once a primary research advisor has been selected, this faculty member will assume advising responsibilities.

MS degree candidates should become affiliated with a faculty member and his/her research laboratory during the first year in the Graduate Program. 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.

The primary research advisor is typically a member of the regular faculty of the Department of Anatomy & Neurobiology, or a faculty member of another department within GMS may also serve as a student's 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 thesis must be a member of the regular faculty of the Department of Anatomy & Neurobiology and a faculty member of GMS. The primary research advisor is always the first reader of the thesis.

3. Writing of the Thesis

The format and formal requirements for a thesis are outlined on the GMS website (see Guide for Writers of Theses and Dissertations a <http://www.bumc.bu.edu/gms/students/research-thesis-dissertation/>).

The thesis is to be based on the research carried out by the MS degree candidate. The research project is to be well-conceived, and, in the best-case scenario suitable for submission as an article to a scientific journal.

The student MUST refer to the GMS [Graduation Calendar](#) for all graduation deadlines, including the exact due date of the Thesis, which is typically April 1. This information, along with other important graduation deadlines, can be found under "Calendars and Important Dates" on the Division of Graduate Medical Sciences website.

D. Assessment of MS Degree Candidate Progress

During the spring of each academic year, the student and his/her advisor will meet with the GEC in the Annual Student Review. The review is a forum for the student to highlight and explain their academic, research, and teaching 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, academic performance, and teaching performance.

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, and; d) service to the Department, School, and/or community?
2. If performance in class or in research did not fulfill the 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 a) courses; b) research progress; c) professional development, and; d) service to the School and/or community?
4. What is the timeline for completion of the program, and what are the student's future plans?

E. 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.
- All students must participate in Journal Club once each year. Only one Journal Club is taken for credit.

F. Graduate Education Committee (GEC)

This committee 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 Chair (ad hoc).

The Graduate Program Director or other members 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 student may appeal a decision of dismissal to the Chair of the Department and/ or the Ombuds, who will present the student's case to the GEC. Note that there are also GMS policies about 10



program dismissal that are covered in the GMS Policies and Procedures handbook: <http://www.bumc.bu.edu/gms/students/policies-procedures-handbook/>

G. Department Graduate Student Organization

During the first month of the academic year, department graduate students as a group will be responsible for: (1) recommending an Ombuds, (2) selecting representatives to plan the annual Raviola seminar and reception, (3) selecting representatives to designated department committees, and (4) selecting graduate student representatives who act as the primary spokespersons for graduate student concerns.

H. 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.

I. Miscellaneous

1. Tutoring, Extramural Teaching or Other Employment

Students may participate in tutoring or extramural teaching with permission from their advisor. In addition, international students should check with their ISSO advisor about whether this is allowable as well.

2. Vacations and Leaves of Absence

In addition to the standard Medical School, National and State holidays and winter intersession, a maximum two-week vacation period may be taken by the student during the year. The timing and length of the vacation should be discussed well in advance with the student's advisor. Normally, students should expect to engage in research during the summer months. Students should inform the Departmental Administrator of their vacation plans. Note that spring break is not observed for graduate students.

The GMS Bulletin, under Academic Policies and Procedures, describes the procedures involved with Leaves of Absence.

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: <http://www.bu.edu/reg/calendars/semester/>

Note that since a number of our 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: <http://www.bumc.bu.edu/busm/education/academic-affairs/academic-calendars/#1>

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: <http://www.bu.edu/thebus/> and on the "Terrier Transit" App.

The following links provide information about bus passes, public transportation and parking:

http://www.bu.edu/parking/transportation/semesterpass_fall/

http://www.mbta.com/schedules_and_maps/bus/

<http://www.bumc.bu.edu/parking/>

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) (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 room 102 at 710 Albany Street. Enter the Parking and TransComm lobby, and the ID Office is the first door on the left. 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.