

BU BME Department

***Graduate Handbook
for Masters Students***

Fall 2024

Notice of Nondiscrimination

Boston University prohibits discrimination and harassment on the basis of race, color, natural or protective hairstyle, religion, sex or gender, age, national origin, ethnicity, shared ancestry and ethnic characteristics, physical or mental disability, sexual orientation, gender identity and/or expression, genetic information, pregnancy or pregnancy-related condition, military service, marital, parental, veteran status, or any other legally protected status in any and all educational programs or activities operated by Boston University. Retaliation is also prohibited. Please refer questions or concerns about Title IX, discrimination based on any other status protected by law or BU policy, or retaliation to Boston University's Executive Director of Equal Opportunity/Title IX Coordinator, at titleix@bu.edu or (617) 358-1796. Boston University's full Notice of Nondiscrimination is available at <https://www.bu.edu/policies/boston-university-notice-of-nondiscrimination/>.

College of Engineering Graduate Policy

Academic Standards

The academic progress of every graduate student is reviewed at the end of each semester. Failure to make satisfactory progress and remain in **Good Standing** can result in **Academic Probation**, **Suspension** for a stated time or until stated conditions are met, or **Dismissal**, as detailed below.

Grades of C– or lower are not acceptable for Masters students.

Good Standing

Students maintain good academic standing when they: (1) earn a semester GPA of at least 3.0 (students enrolled only in Pass/Fail courses are exempt from the semester GPA standard); and (2) maintain a cumulative GPA of at least 3.0.

Academic Probation

A student is put on **Academic Probation** when student earns a semester or cumulative GPA below 3.0. Students on Academic Probation may have their financial aid discontinued. In the event that the semester or cumulative GPA is below a 2.0, a student may be dismissed from the program.

Students are reviewed after one semester on Academic Probation. Those who earn a semester and cumulative GPA of 3.0 or above will return to **Good Standing**. Those students who do not achieve Good Standing (as defined above) after the probationary semester will be subject to **Academic Suspension**, **Dismissal**, or an additional semester of Academic Probation as determined by the College on a case-by-case basis.

Academic Suspension

A student on Academic Probation faces Academic Suspension or Dismissal when s/he has not achieved **Good Standing** (as defined above) after the most recent semester of Academic Probation. Specifics regarding **Dismissal** or the duration and terms of the **Academic Suspension** will be determined by the College on a case-by-case basis. Dismissal results in permanent separation from the University. Appeals of Dismissal or Suspension are directed to the Associate Dean for Academic Programs.

Reinstatement after Academic Suspension

Students who have fulfilled their period of **Academic Suspension** must meet with their academic advisor and must also reestablish their standing in the College by contacting the College of Engineering Graduate Programs Office (enggrad@bu.edu or 617-353-9760).

College of Engineering GPA Requirement for Awarding Graduate Degrees

Masters students must earn a grade point average of at least 3.0 in the set of courses used to satisfy the program requirements for the degree.

Technical Elective Exceptions

Note: The following courses, although offered by the College of Engineering, do **not** meet the requirement of a technical elective: BE 795, BF 510, ME 502, ME 517, ME 518, ME 525, ME 550, ME 583, ME 584, ME 703 and EK 731. SI 839, SI 852, SI 855, SI 871, and PH 825 also do not qualify as a technical elective. Technical electives do not need to be taken within the College of Engineering; appropriately quantitative and rigorous courses offered through other BU Colleges may be approved using the [BME Petition Form](#).

Auditing Courses

An auditor is a student who attends a class to acquire knowledge but not to earn credits or a grade. Audited courses do not count toward completing degree requirements. An auditor may not change his or her status after the fifth week of classes for standard courses. Auditors must attend classes regularly, complete assigned reading, and participate in discussions, but they are excused from examinations.

Auditors are admitted to a course on a space-available basis and with the approval of the instructor. Auditors are subject to the full tuition and fees of the course. Students may not audit ENG 900-level, language, physical education, studio, or laboratory courses.

University Policies and Resources

Equal Opportunity and Nondiscrimination

[Complaint Procedures in Cases of Alleged Unlawful Discrimination or Harassment](#)

[Disability Accommodation](#)

[Equal Opportunity/Affirmative Action Policy](#)

[Sexual Misconduct/Title IX Policy](#)

[Student Grievance Procedure in Cases of Alleged Disability Discrimination](#)

If you have questions about the policies above, please contact:

Stacey Herman, Director of Graduate Programs Office at smherman@bu.edu or 617-353-9763.

Mental Health Resources

Graduate students have access to mental health resources through the [Student Health Services Behavioral Medicine Office](#). These services are open to all full-time students. To contact the office, call 617-353-3569. They offer help for issues related to stress, anxiety, depression, sleep concerns, attentional issues, and many other topics. They can also refer you to appropriate specialized providers if necessary. In addition to individual assistance, they offer programming specific to graduate students, such as a weekly graduate student discussion groups.

Clinicians are available 24/7, for daytime emergency triage and phone consultations, as well as mental health emergencies that occur after the clinic is closed. Call 617-353-3569 anytime, 24/7.

Master of Science and Master of Engineering Degrees “with Engineering Practice”

The College of Engineering offers an Engineering Practice degree option to students in all of its Masters programs.

Engineering Practice is a valuable opportunity for a student at the Masters level to complete an approved internship integral to their program of study, thereby allowing them to develop additional technical and professional skills. Students interested in the Engineering Practice degree option must [apply](#) and meet the requirements outlined below. Students successfully completing the Engineering Practice degree option of their program will earn the accompanying degree designation (e.g., Master of Science in Biomedical Engineering with Engineering Practice).

Internships used to complete the degree requirements must be relevant to the student's program of study and must go through a program-level approval process. Satisfactory completion of the requirement is determined by the program and then formally recorded by the Graduate Programs Office (enggrad@bu.edu; 617-353-9760).

Requirements and Grading

- An internship site and project must be approved by the student's Academic Advisor.
- A mid-point review between the student and the Internship Supervisor must be conducted and submitted.
- Before the end of the semester in which the internship takes place, a final report must be submitted and reviewed by the Academic Advisor.
- Students receive a grade of Pass or Fail. The final grade is based on satisfactory completion of all requirements and is determined by the Academic Advisor in consultation with the Internship Supervisor.

For International Students

- International students must have completed two semesters in full-time status to be eligible to begin an internship in the United States, and they must complete additional paperwork with the BU International Students and Scholars Office (ISSO) after registration.
- International Students with an off-campus internship must complete the **Curricular Practical Training (CPT) form**, and bring the approved **Engineering Practice Approval form** and the CPT form to the ISSO for review and approval for off-campus Curricular Practical Training.

Summary of Course Requirements for BME Masters Students

Note for all BME Masters Programs: The courses listed under the Technology Leadership electives section below **do not** meet the requirement of a technical elective.

MEng Students

BE 694 *Biomedical and Clinical Needs Finding*

BE 695 *Advanced Biomedical Design and Development*

Three Graduate-Level Biomedical Engineering Electives (BE 695 satisfies one, these courses must be taken within BME department)

Two Graduate-Level Technical Electives (may include additional BE coursework)

Math Requirement selected from approved list (located in the handbook and online)

Two Technology Leadership Electives from the list below (BE 695 satisfies one)

ENG ME 502 Invention: Technology Creation, Protection, and Commercialization

ENG ME 510 Production Systems Analysis

ENG ME 517 Product Development (*not available currently*)

ENG ME 525 Technology Ventures
 ENG ME 537 Product Realization
 ENG ME 550 Product Supply Chain Design
 ENG ME 583 Product Management
 ENG ME 584 Manufacturing Strategy
 ENG ME 703 Managerial Cost Accounting
 ENG EK 731/QST HM 801 Bench to Bedside – Translating Biomedical Innovation from the Lab to the Marketplace
 QST HM 703 Health Sector Issues and Opportunities
 QST HM 710 Health Service Delivery: Strategies, Solutions and Execution
 QST HM 817 Advances in Digital Health
 QST HM 848 Driving Health Sector Innovation
 QST SI 839 Design Thinking and Innovation
 QST SI 750 Competition, Innovation, and Strategy
 QST SI 845 Technology Strategy
 QST SI 852 Starting New Ventures
 QST SI 855 Entrepreneurship
 QST SI 871 Strategies for Bringing Technology to Market

MEng students must complete a minimum total of **32 credits** of approved coursework. No thesis is required. The practicum requirement is satisfied through BE 695. A finalized [Program Planning Sheet](#) should be submitted for approval by the Director of BME Masters Programs when applying for graduation, indicating the courses taken to fulfill the curriculum requirements. A cumulative grade point average of 3.0 must be maintained. Grades of C- or lower are not acceptable. Technical electives are highly quantitative courses in engineering, computer science, math, physics, etc. They do not have to be taken within ENG; hard science courses offered through other BU Colleges may be approved using the [BME Petition Form](#). Technical Leadership electives outside of the provided list must be approved by the Director of BME Masters Programs.

MEng Program Completion Time Schedule

Each student has a [maximum of five \(5\) years](#) from the time of matriculation to complete the requirements for the MEng degree. If a student has still not finished the required courses in this time, the student must reapply and be accepted again to the department in order to continue.

MS with Thesis Students

Math Requirement selected from approved list (located in the handbook and online)

BE 605 *Molecular Bioengineering* or **BE 606** *Quantitative Physiology for Engineers*

BE 790 *Biomedical Engineering Seminar*

Three Graduate-Level Biomedical Engineering Electives (these courses must be taken within BME department)

Two Graduate-Level Technical Electives (may include additional BE coursework)

BE 954 Thesis Research (8 credits)

MS with Thesis students are required to complete a minimum total of **36 credits** and successfully propose and defend an original MS thesis. A finalized [Program Planning Sheet](#) should be submitted for approval to both Research Advisor (Academic Advisor if the research advisor is off-campus) and the Director of BME Masters Programs when applying for graduation, indicating the courses taken to fulfill the curriculum requirements. A cumulative grade point average of 3.0 must be maintained. Grades of C- or lower are not acceptable. Technical electives are highly quantitative courses in engineering, computer science, math, physics, etc. They do not have to be taken within ENG; hard science courses offered through other BU Colleges may be approved using the [BME Petition Form](#).

MS with Project Students

Math Requirement selected from approved list (located in the handbook and online)

BE 605 *Molecular Bioengineering* or **BE 606** *Quantitative Physiology for Engineers*

BE 790 *Biomedical Engineering Seminar*

Three Graduate-Level Biomedical Engineering Electives (these courses must be taken within BME department)

Three Graduate-Level Technical Electives (may include additional BE coursework)

BE 952 *Mentored Project* (4 credits)

MS with Project students are required to complete a minimum total of **36 credits** and complete the required 4 credit Mentored Project. A suitable project must be identified and [approved](#) by the Director of BME Masters Programs. The mentored project must be supervised by a primary BME faculty member or an approved outside advisor. A finalized [Program Planning Sheet](#) should be submitted for approval by the Director of BME Masters Programs (and Academic Advisor if it's not Mario Cabodi) when applying for graduation, indicating the courses taken to fulfill the curriculum requirements. A cumulative grade point average of 3.0 must be maintained. Grades of C- or lower are not acceptable. Technical electives are highly quantitative courses in engineering, computer science, math, physics, etc. They do not have to be taken within ENG; hard science courses offered through other BU Colleges may be approved using the [BME Petition Form](#).

Credit for Courses Taken Elsewhere

Students may “place out of” required courses (but not electives, BE 952 or BE 954), if they have taken equivalent courses elsewhere at the graduate level, *as long as those courses were not used to meet the requirements of an undergraduate or previous degree*. For example, students who have taken a graduate-level physiology course may receive permission not to take BE 606. Students with extensive experience in quantitative molecular biology may receive permission not to take BE 605. This permission must be granted by submitting a [BME Petition Form](#) BEFORE the end of the Add/Drop period.

Though students may place out of specific course requirements, this does not alter the total number of credits a student must earn at Boston University (32 for MEng students and 36 for MS students) to meet the degree requirements.

Courses that Fulfill the BME Math Requirement

Students must complete one 4-credit or two 2-credit math courses (BE 601-604) from the list below and pass with a B+ or higher. Students may petition for a different course (500-level or higher) to satisfy the math requirement.

- ENG BE 567 Nonlinear Systems in Biomedical Engineering
- CAS MA 581 Probability
- CAS MA 582 Mathematical Statistics
- CAS MA 684 Applied Multiple Regression and Multivariable Methods
- ENG ME 566 Advanced Engineering Mathematics
- ENG EK 501 Mathematical Methods I: Linear Algebra and Complex Analysis
- CAS MA 579 Numerical Methods for Biological Sciences
- CAS MA 583 Introduction to Stochastic Processes

- ENG BE 601 Linear Algebra
- ENG BE 604 Statistics and Numerical Methods

NOTE: BE 601-604 series must be taken together as they are half-semester courses (2 credits each) to satisfy the Math Requirement. Rudimentary programming skills are necessary for these modules.

- ENG BE 747 Advanced Signals and Systems Analysis for Biomedical Engineering
- GRS MA 681 Accelerated Introduction to Statistical Methods for Quantitative Research
- ENG EC 505 Stochastic Processes
- CAS PY 501 Mathematical Physics
- CAS MA 561 Methods of Applied Mathematics I
- CAS MA 565 Mathematical Models in the Life Sciences
- CAS MA 588 Nonparametric Statistics

Finding a Research Home

Most students choose to perform their research with a primary BME faculty member or within affiliated research centers (Biological Design Center, Biomolecular Engineering Research Center, Center for Multiscale and Translational Mechanobiology, Nanotechnology Innovation Center, Neurophotonics Center, NSF Engineering Research Center in Cellular Metamaterials, Precision Diagnostics Center). Further information can be found on their respective websites.

Faculty, scientists or researchers (holding a PhD or MD) within or outside of the University can be approved using the [MS Thesis Supervisor Approval Form](#) to be a student's principal research advisor if they have an active research collaboration with a primary BME faculty member who will agree to be the student's research co-advisor. This form should be submitted as soon as the co-advisors are identified.

Research Project

A major requirement for the MS with Thesis is a research-based thesis. Each student is responsible for finding a research project, conducting scientific studies under the guidance of an approved faculty member, presenting the [proposal](#) and results to the general scientific community in a public [defense](#) and submitting a Thesis.

Academic vs. Research Advisors

All incoming Masters students are advised by Prof. Mario Cabodi, Director of BME Masters Programs.

For MS with Thesis students, the research advisor also serves as the student's academic advisor. However, if a MS Thesis Supervisor Approval Form was required (see above), the BME co-advisor serves as the academic advisor.

Finding a Research Advisor and Project

Occasionally students enter the program with a specific research advisor in mind and may even plan to work on a specific project. The majority of students, however, will utilize the first two semesters to determine what their specific interests are in the field of biomedical engineering and identify potential labs.

Another valuable way of learning more about specific research opportunities is through the required BE 790 seminar series and to speak with other graduate students who are currently working in the department's various labs. The best measure for learning about working in a specific lab is to make an appointment to speak with the faculty member in charge of a lab you are interested in. Once a student finds a research opportunity and has the consent of a faculty member to be his/her advisor, the process of developing a thesis project begins.

Off-Campus Thesis

Thesis research is usually carried out in laboratories and centers of BME faculty located on campus. In cases of non-BU advisors (see section above regarding required approval) the research is often performed off-campus, in the lab of the principal research advisor. There may be special problems that arise due to intellectual property and other conflicts of interest, which must be addressed prior to starting the work.

Invention and Copyright Agreements

Students who receive support from sponsored research programs or who make significant use of University funds and facilities are required to sign the BU Intellectual Property Policy Agreement. Seek counsel with your faculty advisor about this policy. A signed agreement form is required through PolicyTech for the Charles River Campus.

MS Thesis Advisory Committee Membership

After identifying a research advisor and project, each MS Thesis student forms an Advisory Committee which will run the MS Proposal and Thesis Defense.

The Advisory Committee must have a minimum of three members:

- Two members must be from the BME primary faculty (tenured or tenure-track).
- One member must have a primary appointment within the College of Engineering (BME Affiliated faculty, BME Research faculty or appropriate BME Research Associates can fill this role).
 - NOTE: If the committee includes three members from the primary BME faculty, then no one from this category is required.

The Chair of the Advisory Committee must be a primary BME faculty member who is NOT the research advisor or co-advisor.

If a researcher from outside the University serves on an Advisory Committee, a [Special Service Appointment Form](#) must be completed. The completed form and a copy of the person's curriculum vitae, with the Associate Chair for Graduate Programs signature, will then be submitted to the Graduate Programs Office for College-level approval.


MS Thesis Proposal

A brief written proposal (3-5 pages) of the MS research project must be presented no later than the semester before the student defends their thesis. It is the student's responsibility to schedule a formal meeting with their Advisory Committee members for discussion and approval of the proposal document. The student must present the [MS Proposal and Thesis Committee Approval Form](#) to the committee during this meeting. If the proposal is approved, the faculty members must sign the form, thereby indicating their willingness to participate on the committee. The student must submit the signed approval form, slides and the proposal document to Inna Gerzon. It is required that the student's committee meet with the student regularly (at least annually) throughout the remainder of their thesis research.

MS Thesis

A Thesis must be written and defended successfully for completion of the MS degree. In order for a student to make full use of the critiques on the proposal offered by his/her committee, students are not permitted to defend in the same semester in which the proposal was submitted. A full description of the format requirements for the written thesis is included in the BU Libraries ["A Guide for the Writers of Dissertations and Theses"](#). It is the student's responsibility to confirm a date and time of the presentation with their committee members. The [MS Thesis Defense Approval Form](#) must be completed and submitted to Inna Gerzon two weeks prior to the presentation date. She will process announcement of the MS Thesis Defense to the BME faculty and graduate students via email and add the event to the BME calendar.

The format of the defense is not rigid and is decided on by the Chair of the Advisory Committee. The student can expect to give a 30-40 minute seminar presenting the results of the completed project. There may be questions during the presentation or after the student has completed the presentation, depending on the decision of the committee.


Following a reasonable question period, the audience is dismissed, so that the committee may ask questions of the student privately; then the student is dismissed and the committee remains to complete its assessment of the thesis defense. The Advisory Committee must vote unanimously to pass the student. The results are noted on the  MS Thesis Defense Form and submitted to Inna Gerzon.

Submission of the Final Thesis

The student will then follow the [electronic submission guidelines](#) provided by Mugar Library. Inna Gerzon will provide departmental electronic approval for the student upon receiving the original signatures page.

MS Program Completion Time Schedule

It is up to the student and their research advisor to complete the project in a reasonable amount of time for a MS thesis. Most students graduate from the MS with Thesis program in two years after entering, which usually includes at least one year of full-time work on the research project.

Each student has a  [maximum of five \(5\) years](#) from the time of matriculation to complete the requirements for the MS degree. If a student has still not finished the required courses and research thesis in this time, the student must reapply and be accepted again to the department in order to continue.

Financial Information

Students receiving any form of financial support for graduate studies are not permitted additional employment without prior written approval from both the student's advisor and the department.


Masters Research Assistantships

It is important to first recognize that Masters Research Assistantships (MRA's) are not guaranteed for MS with Thesis students. MRA's are offered by individual faculty members with sponsored research grants. Students interested in off-campus Masters Research Assistantships should speak with the Director of BME Masters Programs for departmental approval (to ensure that the research project is appropriate and that there is direct involvement of a BME faculty member).

A Masters Research Assistant (MRA) is a member of a research group in a laboratory or center. Work on the Thesis is normally part of this position's assignments. MRA's are expected to work full-time, with time allowed for courses during the academic year. An MRA carries no tuition support.

Logistical Information

BME Graduate Student Lounge

The BME Lounge is located on  the second floor of 44 Cummington Mall near the elevator. (NOT ACCESSIBLE until Spring 2025)

BME Kitchenette

There is a small kitchenette (including a refrigerator) that is available for faculty, graduate students and staff in ERB 407. A copy machine is available for students. (NOT ACCESSIBLE until Spring 2025)

Getting to the BU Medical School Campus

Traveling between Boston University's Charles River campus and the Medical Campus is easy thanks to the **Boston University Shuttle (The BUS)** service. The Shuttle runs every 10-30 minutes (depending on the day and time). IT IS FREE! Call 877-355-1555 to receive recorded information. The closest stop is at the corner of Blandford St and Commonwealth Ave. [Schedules and real-time bus locations](#) can be found online.

Staff Directory

BME Graduate Programs Administration

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