Guidelines for NYU-Tandon Biomedical Engineering PhD Students

(updated on Oct 17, 2021)

All students in the Biomedical Engineering (BME) PhD program are required to peruse this document and are responsible for abiding by the herein stated deadlines and rules. Failure to do so could lead to the loss of PhD candidacy status. Students should meet at least once a year with the members of the Graduate Student Committee (GSC) of the BME department, who will assess their progress in coursework and compliance with other administrative requirements.

Students should also refer to the department's website (Degree Requirements) and the bulletin for academic requirements and policies (e.g., transfer credits and required/elective courses) for the PhD degree in Biomedical Engineering. Note that the selection of non-BME electives requires the approval of the BME PhD Academic Advisor.

1. Selection of Research Advisor and Dissertation Guidance Committee

A PhD student must have a dissertation advisor within the BME faculty. Many factors enter the selection process; in addition to the common research interest and personality considerations, the financial aspects must also be considered. The ideal situation is to identify an advisor who has a project on a topic of mutual interest and has funding to support the student as a Research Assistant.

First-year PhD students, who have not been assigned a dissertation advisor together with their admissions letter, will be asked to interview with potential faculty dissertation advisors in the Fall semester of their first year. By December 20st, the students must submit to the BME Graduate Student Committee (GSC) a list of four dissertation advisors in the order of preference. The committee will review the choices, consult with dissertation advisors and submit their report to the department chair who will make the final decision. The BME graduate committee will notify the students of their advisor assignment before the beginning of the spring semester.

A dissertation guidance committee (DGC), comprised of the research advisor and three other faculty members (preferably two BME core faculty members and one external faculty member) will be named with approval of the GSC. The function of the DGC will be to monitor the student's progress throughout the program. Usually, the members of the DGC will become members of the Dissertation Defense Committee (DDC) at the end of the program.

2. Qualifying Examination

Students in the BME PhD program are required to take and pass a doctoral qualifying examination (DQE), to advance to candidacy for the Ph.D. degree. The DQE can be scheduled as early as the end of the first year, and not later than the end of the second year. Students must submit a formal application to take the exam. The application should include the names of three or more faculty members who are willing to serve on the qualifying examination committee; these must be appointed by the departmental GSC and should include the PhD research advisor. The purpose of the qualifying examination is to test the particular knowledge that is pertinent to the research focus area in which the student's dissertation research will be undertaken. It is

intended to discern the student's ability to communicate ideas and concepts. Students are expected to be especially knowledgeable in the scientific area related to their proposed research.

The format of the examination is in two parts. For the written part, the student will receive assigned thematically focused publications in Biomedical Engineering from the examiners that the student will have two weeks to read and then provide a written critical summary and analysis. For the oral portion of the exam, the student will explain and defend their analysis of the papers. During the oral part of the examination, questions from the committee will not necessarily be limited to the student's assigned papers, but may cover other aspects of the student's academic training up to that point. The examination will be graded as pass or fail by majority vote. In the case of failure, the right to a second examination is at the discretion of the BME GSC and NYU Tandon Office of Graduate Academic Affairs. Failure to pass the qualifying examination by the end of the second year will result in disqualification from the program. This decision is not subject to formal appeal. The result of each student's examination will be delivered to the Registrar of NYU Tandon, in writing, no later than two week following the exam.

To be eligible to take the DQE, students should take all required BME graduate courses and BME graduate electives outlined by the BME PhD Academic Advisor. Students should consult with the BME PhD Academic Advisor about the criteria required for taking the DQE qualification. Students are not eligible to take the DQE if their cumulative GPAs are lower than 3.0 in all BME graduate courses (excluding seminars, guided studies, and other research credits) taken at NYU Tandon during their first academic year. The DQE eligibility also requires students to receive no more than one C grade or lower (*i.e.,* C+, C and F) in the BME graduate courses taken by the end of the first academic year.

If necessary, the committee may pass a student with a condition that the student successfully complete additional coursework or achieve a defined research milestone. Students who are ineligible to take the DQE in the first year because of the failure to meet the academic requirements must consult with the BME GSC and their research advisors about their options. Once the students meet the academic requirements, they may be allowed to take the DQE in the second year. To maintain the PhD candidacy status, students must pass the DQE by the end of the second year. Students who fail to pass the DQE may consider completing the requirements to obtain a terminal master's degree in Biomedical Engineering.

Results of the DQE are recorded in the student's transcript as RE-GY 9990. Until students pass the DQE, they cannot register for PhD dissertation credits (BE-GY 999X), but can register for up to 9 credits of BE-GY 998X that can count towards the total dissertation credits, upon the approval of the academic and research advisors. Note that BE-GY 998X does not qualify international students for full-time equivalency, in the way that BE-GY 999X does. Therefore, any international student taking BE-GY 998X will still have to be enrolled full-time for 9 credits total to maintain their visa status.

3. Research Proposal Defense

A Research Proposal examination, overseen by the DGC and based on a dissertation research proposal and preliminary data, must be passed by the end of the third year. The objective of this exam is to ensure the student has chosen an appropriate PhD research topic and that the research plan is rigorous and has high likelihood of success. The results of each student's proposal examination will be delivered to the Registrar of NYU Tandon in writing, no later than one week following the exam.

4. Annual Progress Meeting

The DGC will continue to meet at least once per year with the student for a review of progress, and will provide detailed feedback advice to the student. A report following each annual meeting must be filed with the GSC.

5. Dissertation Defense

With the approval of the PhD research advisor and the DGC, the student will submit a written dissertation, meeting all requirements of the NYU Tandon School of Engineering. The dissertation must be provided to the members of the Dissertation Defense Committee (DDC) at least one week, but preferably two weeks, prior to the defense. The defense includes a formal, public presentation by the student, with questions from the audience. Following the public presentation, the student meets privately with the DDC members for questions. The committee makes a decision that is then transmitted, in writing, to the Registrar.

The DDC should be composed of five members, including the student's PhD research advisor. Three members have to be core faculty members of the BME department. If the PhD advisor is a core faculty member of the BME department, two other members should be chosen from any combination from the following groups: (i) faculty in other departments at NYU Tandon, (ii) faculty in other schools of NYU (e.g. Grossman School of Medicine), (iii) qualified faculty from other academic institutions, or (iv) qualified individuals holding a PhD degree from industry. If the PhD advisor is not a core faculty member of the BME department, the committee should be completed by 3 core faculty members and one other member to be chosen from one of the following groups: (i) faculty in other departments at NYU Tandon, (ii) faculty in other schools of NYU (e.g. Grossman School of Medicine), (iii) qualified faculty from other academic institutions, and (iv) qualified individuals holding a PhD degree from industry. The qualifications and eligibility of individuals in groups (iii) and (iv) and the list of committee members will be reviewed by GSC and the PhD research advisor for final approval.

6. Full-time Study for the PhD degree

Full-time status is defined as 9 or more credits per semester (fall and spring) of coursework prior to passing the qualifying exam. Students who have passed the PhD qualifying exam are considered full-time if they register for a minimum of 3 credits of dissertation (BE-GY 999X) per semester (fall and spring). Once students begin their PhD dissertation research (i.e., start taking dissertation credits), they must register for a minimum of 3 dissertation credits each fall and

spring semester until the dissertation is completed. If students register only for 3 credits of a "regular" course (but no dissertation credits), they are not considered full-time students. Full time equivalency (FTE) is a recognition that the nature of dissertation work often requires a full-time effort, irrespective of the number of credits taken.

Once PhD students have completed the credit requirements (that is, 75 credits including all necessary coursework and dissertation credits), they may request Maintenance of Studies (MOS) every fall and spring semesters (and summer, if they intend to graduate in the summer) with no tuition charge (institute fees still apply) until completion. Students should refer to the bulletin for guidelines and requirements before requesting MOS. Maintenance of Studies (MAINT-GY4747) officially maintains the student's degree candidacy and their matriculation.

7. Time Limit for PhD Program

The time limit for a PhD degree varies depending on the matriculation year, the number of transfer credits, and full-time or part-time status. Students should refer to the bulletin for details. In general, full-time students transferring fewer than 24 credits have 7 years to complete the PhD program, counting from the time of admission into the PhD program. Full-time PhD students transferring 24 or more credits are granted 6 years to complete their PhD studies, counting from the time of admission into the PhD program at NYU Tandon.

In rare circumstance, an extension of these time periods may be granted with approval from the Associate Dean of Graduate Academics at Tandon. Students must submit a “Request for Extension of Time to Complete Degree Requirements” form available at https://engineering.nyu.edu/academics/support-services/graduate to request an extension, at least 60 days prior to the deadline for completion. The Associate Dean, consulting with the BME department, will prepare a plan for the student to follow to obtain the degree.

8. Leave of Absence

Student may receive up to 2 semesters of leave of absence (LOA), and requests should be submitted through Albert. Personal LOAs are approved through the Office of Graduate Academics, and generally are only permitted for students in good academic standing. Medical LOAs require the approval of the Office of Student Affairs. If approved, the LOA “stops the clock” and does not count against the total time for PhD program completion. Students should refer to the website of Office of Student Affairs (https://engineering.nyu.edu/campus-and-community/student-life/office-student-affairs/policies) for details about the different types of LOAs. Any student who is not registered and who is not on an approved leave of absence is automatically discontinued by the university. Such students must reapply to the PhD program at a future time. However, as is present practice, such students must follow the bulletin and rules in effect at the time of the readmission (if granted). LOAs may affect immigration status, and international students should consult with OGS before taking a leave. Students should refer to the Academic Support Services website (https://engineering.nyu.edu/ academics/support-services/registration/registration-forms) for submission of LOA requests.

TABLE 1 – A Typical Timetable of PhD, DQE, and Dissertation Requirements

Exam/Meeting	**Typical timing (outcome)**	**Format, requirements, and purpose**
Doctoral Qualifying Exam	Year 1 to 2, Pass/Fail	Brief written research plan and work to date. Oral critique on a committee-chosen paper in front of BME faculty. Satisfactory progress in classwork. The goal is to determine if the student has a satisfactory understanding of fundamentals and a research topic to progress to PhD candidacy.
Research Proposal Defense	Year 2 - 3, Pass/Fail	An oral presentation on research to date and a proposal for future work. The goal is to determine if the student can conduct and plan independent original research.
Annual Progress Meeting	Years 3 & 4 Spring Pass/Fail	An oral presentation and a written document on research to date. The goal is to update the dissertation guidance committee and receive critical feedback on setting future goals.
Dissertation Defense	Year 4 or Later Pass/Fail	An oral defense of a written dissertation. The goal is to determine if a student has conducted original, in-depth research for which a PhD degree can be granted.

Table 2: Example of how a typical student may progress through the BME PhD program.

Term: Fall year 1			**Term: Spring year 1**		
Course Number and Title	**Credit**	**R/E***	**Course Number and Title**	**Credit**	**R/E***
BE-GY 6103 Anatomy, Physiology, and Biophysics I	3	R	BE-GY 6503 Bioinstrumentation Or BE-GY 6783 Biomechanics for Biomedical Engineers	3	R
BE-GY 6473 Applied Mathematics and Statistics for Biomedical Engineering	3	R	BE-GY 9753 Bioethics Seminar	3	R
BE-GY course from list (see below)	3	R	BE-GY course from list (see below)	3	R
BE-GY 9730 Colloquium in Biomedical Engineering	0	R	BE-GY 9730 Colloquium in Biomedical Engineering	0	R
BE-GY 9740 Seminar in Biomedical Engineering	0	R	BE-GY 9740 Seminar in Biomedical Engineering	0	R
Term Credit Total:	9	R	Term Credit Total:	9	R
Term: Fall year 2			**Term: Spring year 2**		
BE-GY courses from list (see below)	6	R	BE-GY course from list (see below)	3	R
BE-GY course from list or BE-GY 999x PhD Thesis in Biomedical Engineering	3	R	BE-GY courses from list and/or BE-GY 999x PhD Thesis in Biomedical Engineering	6	R
BE-GY 9730 Colloquium in Biomedical Engineering	0	R	BE-GY 9730 Colloquium in Biomedical Engineering	0	R
BE-GY 9740 Seminar in Biomedical Engineering	0	R	BE-GY 9740 Seminar in Biomedical Engineering	0	R
Term Credit Total:	9	R	Term Credit Total:	9	R
Term: Fall year 3			**Term: Spring year 3**		
BE-GY 999x PhD Thesis in Biomedical Engineering	3-9	R	BE-GY 999x PhD Thesis in Biomedical Engineering	3-9	R
BE-GY courses from list	0-6	E	BE-GY courses from list	0-6	E
BE-GY 9730 Colloquium in Biomedical Engineering	0	R	BE-GY 9730 Colloquium in Biomedical Engineering	0	R
Term Credit Total:	9	R	Term Credit Total:	9	R

Term: Fall year 4			**Term: Spring year 4**		
BE-GY 999x PhD Thesis in Biomedical Engineering	6-9	R	BE-GY 999x PhD Thesis in Biomedical Engineering	6-12	R
BE-GY courses from list	0-3	E	BE-GY courses from list	0-3	E
BE-GY 9730 Colloquium in Biomedical Engineering	0	R	BE-GY 9730 Colloquium in Biomedical Engineering	0	R
Term Credit Total:	9	R	Term Credit Total:	9-12	R
Term: Fall years 5-6 (if needed)			**Term: Spring years 5-6 (if needed)**		
BE-GY 999x PhD Thesis in Biomedical Engineering	3-9	R	BE-GY 999x PhD Thesis in Biomedical Engineering	3-9	R
BE-GY 9730 Colloquium in Biomedical Engineering	0	R	BE-GY 9730 Colloquium in Biomedical Engineering	0	R
Term Credit Total:	3-9	R	Term Credit Total:	3-9	R

* Required or Elective

List of Courses in BME PhD Program:

Fall courses

BE-GY 871x Guided Studies in Biomedical Engineering 1.5, 3, or 6 Credits
BE-GY 873x Research in Biomedical Engineering 1.5, 3, or 6 Credits
BE-GY 999x PhD Thesis in Biomedical Engineering, 3, 6, 9, or 12 Credits
BE-GY 6103 Anatomy, Physiology and Biophysics I 3 Credits
BE-GY 6203 / ECE-GY 6813 Medical Imaging 3 Credits
BE-GY 6303 Bio-Optics 3 Credits
BE-GY 6353 Special Topics in Biomedical Engineering 3 Credits
BE-GY 6403 / ECE-GY 6113 Digital Signal Processing 3 Credits
BE-GY 6453 / ECE-GY 6303 Probability and Stochastic Processes 3 Credits
BE-GY 6473 Applied Mathematics and Statistics for Biomedical Eng 3 Credits
BE-GY 6483 / ECE-GY 6183 Digital Signal Processing Laboratory 3 Credits
BE-GY 6513 Biomedical Device Design and Development 3 Credits
BE-GY 6803 Biomaterials: Engineering Principles and Design Considerations
BE-GY 9443 Tissue Engineering 3 Credits
BE-GY 9730 Colloquium in Biomedical Engineering 0 Credits
BE-GY 9740 Seminar in Biomedical Engineering 0 Credits
BE-GY 9763 Regulatory Issues Surrounding Medical Devices 3 Credits

Spring courses

BE-GY 871x Guided Studies in Biomedical Engineering 1.5, 3, or 6 Credits
BE-GY 873x Research in Biomedical Engineering 1.5, 3, or 6 Credits
BE-GY 999x PhD Thesis in Biomedical Engineering, 3, 6, 9, or 12 Credits
BE-GY 6113 Anatomy, Physiology and Biophysics II 3 Credits
BE-GY 6353 Special Topics in Biomedical Engineering 3 Credits
BE-GY 6403 / ECE-GY 6113 Digital Signal Processing 3 Credits
BE-GY 6453 / ECE-GY 6303 Probability and Stochastic Processes 3 Credits
BE-GY 6503 Bioinstrumentation 3 Credits
BE-GY 6523 BioMEMs and Microfluidics 3 Credits
BE-GY 6723 Natural Polymers and Materials 3 Credits
BE-GY 6763 Rehabilitation Engineering 3 Credits
BE-GY 6783 Biomechanics for Biomedical Engineers 3 Credits
BE-GY 9453 Engineering Tissue Regeneration 3 Credits
BE-GY 9730 Colloquium in Biomedical Engineering 0 Credits
BE-GY 9740 Seminar in Biomedical Engineering 0 Credits
BE-GY 9753 Bioethics Seminar 3 Credits