BME PhD Guidelines and Requirements

Each student is responsible for meeting MTU graduate school requirements and deadlines. Additional information regarding the MTU graduate school and forms can be found at:
http://www.mtu.edu/gradschool/administration/academics/forms-deadlines/doctoral/

Section 1: Required Forms and Deadlines

Each PhD student enrolled in the BME PhD program is required to adhere to the following deadlines. Student requiring additional coursework will be provisionally admitted into the PhD program, and new deadlines will be determined with the student’s advisor and graduate program director. Unless otherwise noted, all forms are to be submitted to the graduate school.

1st Semester

Training: Responsible conduct for research training. No form is needed but student participation will be recorded after completion of the training, which is usually done during orientation offered through the graduate school.

Form: Patent, research and proprietary rights agreement.

Form (internal): Preliminary coursework approval (using Degree Schedule form): Note this is for BME internal use only; the Degree Schedule form will be used and marked as “proposed coursework”. It must be signed by the student’s advisor, department chairman, and graduate coordinator. This form needs to be submitted to the department.

2nd Semester

Form: Advisor and Committee Recommendation form.

Completion of Coursework (2nd – 5th Semester)

Form: Degree Schedule. This form should be filed upon completion of coursework.

Prior to 5th Semester

Form (internal): PhD Oral Qualifying Examination Committee Approval Form. This form needs to be submitted to the department.

Completion of Oral Qualifying Exam and Dissertation Proposal Presentation (5th Semester)

Form: Report on the Comprehensive Exam. Submit to the department.

Form: Approval of Dissertation Proposal. Submit to the department.
Semiannual Progress Report

Form (internal): Biomedical Engineering PhD Research Progress Report. After passing the qualifying exam, the student is required to submit two progress reports per year (due January 31 and August 31) to the department. The progress report must be approved by every dissertation committee member. The student needs to attach the report to the Progress Report cover page and the whole report needs to be submitted to the department.

Research Only Mode

Form: Petition to Enter Full-Time Research-Only Mode. Student is eligible for research-only mode after successfully completing the qualifying exam, defending the dissertation proposal, and completing all required coursework. The research-only mode petition, with the Degree Schedule if not previously submitted, has to be submitted 1 week prior to the 1st day of the semester.

Before Dissertation Defense

Form: Pre-defense Form. The final oral defense may be scheduled using the Pre-defense Form. The form is due 2 weeks prior to the defense.

Dissertation Draft: A draft of the dissertation must be submitted to the graduate school and turned into the committee no later than 2 weeks prior to the defense. However, some committee members may request the dissertation be turned in sooner than 2 weeks prior to the exam.

After Dissertation Defense

Please refer to the graduate school guidelines for needed procedures after completion of the oral dissertation defense.

www.gradschool.mtu.edu/td/submission/#final

Section 2: BME PhD Requirements

Coursework Requirements

A total of 60 credit hours of coursework and research credits are required prior to graduation. A minimum of 20 credits of coursework, with a minimum GPA of 3.25, must be completed while enrolled in the BME PhD program at MTU to be eligible for the qualifying examination. A total of 24 credits of coursework are required to be eligible for the final dissertation defense.

Student’s coursework must be approved by the advisor, graduate coordinator, and department chair. Coursework requirements will vary by individual student based on his or her background. In addition, each student is required to register for 2 semesters of the BME Graduate Seminar (BE 5990). PhD students are expected to attend all seminars throughout their time in the department.

Requirements for Students with Non-Engineering Degrees

In addition to students with BS or MS in engineering degrees, BME department also accepts qualified students from non-engineering programs. To ensure success of these students in the program, students with non-engineering degrees will need to demonstrate proficiencies in mathematics and engineering
knowledge. Deficiencies in engineering topics will be determined by the thesis/academic advisor (if applicable) and the graduate program director. The requirement to fulfill these deficiencies can be accomplished with the following options.

Option 1: Courses: Students need to take specific courses to fulfill the engineering requirement. The exact courses will depend on the student’s deficiencies. The number of credits and courses will be determined by the student’s advisor (and the thesis/dissertation committee, if applicable), and approved by the graduate program director. These extra credits can be counted towards the credit requirement for the degree up to 9 credit hours if the courses are 3000 levels or higher.

Option 2: Independent Projects: If student does not have the proper engineering background in a certain area, he/she can enroll in an independent study/project advised by a faculty with the appropriate expertise, and approved by the graduate program director. The independent project can be counted towards the credit requirement for the degree.

Dissertation Committee
The dissertation committee shall consist of the student’s advisor and at least 3 additional full-time faculty members. Two members must have a primary appointment in the BME Department. There must be at least one member who does not have a primary or adjunct appointment in the BME Department.

Oral Qualifying Exam and Dissertation Proposal Presentation
The student needs to pass the oral qualifying exam and successfully presents his/her dissertation proposal to become a PhD candidate and enter research-only mode. A minimum graduate GPA of 3.25 is required to be eligible. The oral exam and proposal presentation must be scheduled before the beginning of the 3rd year (5th semester) of the PhD program. The oral exam and proposal presentation will be scheduled on the same day but evaluated independently. A student may pass one, but not the other. If a student fails the oral exam or proposal presentation, he or she must re-take the failed portion of the exam within a year. A student that fails either portion of the exam 2 times will be dismissed from the program.

Qualifying Exam Committee: The committee that oversees the oral qualifying exam and dissertation proposal presentation (qualifying exam committee) will consist of all members from the student’s dissertation committee (excluding the advisor). The chairperson of the exam committee must be a BME primary faculty member; the student’s advisor shall only serve as an observer on the qualifying exam committee. Approval of the qualifying exam topics must be made no later than 3 months prior to the exam; it must be approved by the advisor, graduate coordinator, and department chair.

Oral Qualifying Exam: The oral qualifying exam is intended to evaluate the student’s ability for independent thinking, decision making, knowledge of engineering, biological, and medical concepts, and the integration of knowledge as applied to problem solving.

Oral Qualifying Exam Requirement: After scheduling the oral qualifying exam (prior to 3 months before the exam date), each qualifying exam committee member will provide an oral examination topic in 2 weeks, and the student is expected to be in contact with the committee up to the time of the examination to ensure satisfactory progress in preparation. The qualifying exam committee
chairperson is responsible for meeting with, and ensuring that, the exam committee is informed of the guidelines and format of the examination.

Once examination topics have been determined by the individual committee members, the BME PhD Oral Qualifying Examination Committee Approval Form (attached to this Guideline) must be filled out. This form must be approved by the advisor, graduate coordinator, and department chair. The advisor and examination chairperson will ensure that the examination topics are relevant and not redundant.

**Oral Qualifying Exam:** The oral qualifying exam is closed to the public. The student will be examined on the topics relevant to the proposed research that were previously chosen by the dissertation committee. Each member will be allotted 20 minutes for the first round of questions. A second round of questioning may be requested by each committee member.

The decision to pass, conditional pass, or fail a student will be made by the committee, and criteria may vary on an individual basis. If the student fails the oral exam, he or she will be allowed to take the oral examination again. Failure on the second attempt will result in dismissal from the program. If the performance on a particular topic was not sufficiently to pass, but yet not so deficient to fail, a conditional pass may be given. If given a conditional pass, the student will have to meet with the appropriate committee member for further study (generally a short independent study of the particular area).

**Dissertation Proposal:**

**Dissertation Proposal Requirement:** The student will present his or her proposal to the qualifying exam committee covering the background, hypotheses, aims, goals, preliminary data, and experimental methods of the proposed research. The student must provide each committee member the abstract and scope of the research proposal no later than 3 months prior to their qualifying exam. The written research proposal must follow the full research proposal guidelines of a federal funding agency (NIH, NSF, DoD, etc). The final proposal must be submitted to each committee member 2 weeks before the proposal presentation.

**Dissertation Proposal Presentation:** The proposal presentation is opened to the public. The student will give a presentation (45 minute maximum) to the audience covering the background, hypotheses, aims, goals, preliminary data, and experimental methods of the proposed research. The general audience and committee members will question the student on the proposal. Based on the feedback from the entire audience, the qualifying exam committee will evaluate the student’s ability to present and defend a reasonable and technically sound research plan.

*Approval of Dissertation Proposal* form may come upon successful completion of the proposal presentation or may require additional meetings with the committee before approval. Approval must be made within a year of the proposal presentation or the student will be dismissed from the program.

**Completion of Oral Exam and Dissertation Proposal Presentation**

Following successful completion of the oral examination and dissertation proposal, the student is admitted to candidacy for the doctoral degree. The student is now required to meet and submit a written
progress report (form attached in this guideline) to his/her dissertation committee twice per year to keep them abreast of progress and garner their feedback. The format and content requirement of the progress report will be determined by the committee. The committee will append and approve the progress report by highlighting the student’s accomplishments and deficiencies. The committee may determine if more frequent meetings are required.

**Dissertation Defense**

The dissertation defense is opened to the public. The student will give a presentation to the audience. The general audience will first question the student on the proposal. Upon dismissal of the general audience, the dissertation committee members will continue question the student. The committee will evaluate the student’s ability to present and defend the dissertation. If the student does not pass the defense, he/she can retake the defense the second time. Failure in the second defense will result in the student’s dismissal from the PhD program.