



INSTITUTE OF
Biomedical Engineering



2013-2014

Biomedical Engineering Graduate Student Handbook

THE UNIVERSITY of TENNESSEE 
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Institute Director's Welcome Statement

Welcome to the Institute for Biomedical Engineering and the Department of Mechanical, Aerospace, and Biomedical Engineering at the University of Tennessee, Knoxville. The newly established institute mirrors the cross-disciplinary nature of biomedical engineering, as it is comprised of faculty from across multiple departments throughout the University. The substantial diversity this alliance provides gives us the ability to undertake new challenges and ambitious opportunities in medicine.

Our primary mission is to conduct high-impact, cross-disciplinary research and to educate technically trained leaders capable of making decisions that incorporate the perspectives of a diverse array of professionals. These adaptive leaders will be able to take advantage of the extraordinary progress that has been made and will continue throughout the 21st century to further increase our understanding of the living system. This enhanced knowledge presents us with an unprecedented opportunity for application in current challenges, such as optimization of complex healthcare systems, the elusive promise of personalized medicine, bio-inspired design, and the manufacture of new medical technologies at much lower cost than in the past.

I encourage you to explore this handbook to learn more about policies and procedures associated with graduate education in our program.

Sincerely,

Mohamed R. Mahfouz
iBME Director

INTRODUCTION

Introduction from the Graduate School

In order to serve the mission and vision of the Graduate School and preserve the integrity of Graduate Programs at the University of Tennessee, Knoxville, information related to the process of graduate education in each department is to be provided for all graduate students.

Based on Best Practices offered by the Council of Graduate Schools, it is important that detailed articulation of the information specific to the graduate degrees offered in each department/program be disseminated. The Department Graduate Handbook does not deviate from established Graduate School Policies noted in the Graduate Catalog (<http://catalog.utk.edu/index.php> -- navigate to "Academic Policies and Requirements for Graduate Students"), but rather provides the specific ways in which those policies are applied.

Purpose of Handbook

Graduate students are expected to be aware of and satisfy all regulations governing their work and study at the university. Information about these regulations can be found in the Graduate Catalog (<http://catalog.utk.edu/index.php>), the Graduate Student Appeals Resources web site (<http://gradschool.utk.edu/studappresrce.shtml>), and the Hilltopics publications (<http://dos.utk.edu/hilltopics/>).

This handbook sets forth policies and procedures related to graduate education in the Biomedical Engineering Program. If an issue arises that is not explicitly addressed in this document, students are advised to contact their advisor or the Director of Graduate Studies to discuss the situation. Any unaddressed circumstances impacting the awarding of graduate degrees in biomedical engineering require the approval of the Director of Graduate Studies, the Department Head, or the thesis committee.

Beyond general information applicable to all graduate students at UTK, the Graduate Catalog is also a valuable resource for understanding BME degree requirements. To find current information on BME programs, navigate to the College of Engineering link from the menu on the main landing page and scroll down to the Biomedical Engineering section.

Biomedical Engineering Graduate Administration

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Graduate Committee and Graduate Admissions Committee

Dr. Eric Boder, Chair
Associate Professor, Department of Chemical
and Biomolecular Engineering

Dr. Jerome Baudry
Assistant Professor, Department of
Biochemistry and Cellular and Molecular
Biology

Dr. Syed K. Islam
Professor, Department of Electrical
Engineering and Computer Science

Dr. Mohamed Mahfouz
Professor, Department of Mechanical,
Aerospace, and Biomedical Engineering

Dr. Dustin Osborne
Assistant Professor, Department of Radiology

Dr. Andy Sarles
Assistant Professor, Department of
Mechanical, Aerospace, and Biomedical
Engineering

Dr. Christopher Stephens
Research Assistant Professor, Departments of
Mechanical, Aerospace, and Biomedical
Engineering and Surgery

Dr. Justin Baba
Joint Faculty Assistant Professor, Department
of Civil and Environmental Engineering

General Duties and Responsibilities of Faculty and Graduate Students

Participating faculty and graduate students are expected to fully commit to the graduate program and participate in professional activities. Participation in the graduate seminar series, hosting departmental and institute visitors, and student recruiting are particularly important.

Graduate students and their faculty advisors must satisfy all university regulations in a timely fashion. Students and advisors need to maintain awareness of departmental, college, and university requirements and deadlines for completing the program. Information about these requirements may be found in the Graduate Catalog and the Graduate School web site.

ADMISSION REQUIREMENTS AND APPLICATION PROCEDURE

Applications to the graduate program must be submitted through the Office of Graduate Admissions of the Graduate School (<http://graduateadmissions.utk.edu>). University admission requirements are described in the Graduate Catalog. In addition to these requirements, official GRE scores and three letters of recommendation are required for admission. The program-specific application and electronic recommendation letter instructions are provided via the online application at graduateadmissions.utk.edu.

FINANCIAL SUPPORT

Application for Financial Support

The application for admission to the graduate program includes an indication by the applicant of whether financial support is requested. In general, applicants to the PhD program will not be admitted without an offer of assistantship support barring extenuating circumstances. Departmental assistantships are available for MS students only in rare circumstances.

Assistantships may also be available through some interdisciplinary programs on campus. These programs may require a separate application directly to the program. In some cases selected applicants may be nominated for extra-departmental assistantship or fellowship programs by the Graduate Admissions Committee. For more information, contact the iBME Academic Director.

Graduate Assistantships

The MABE department may offer graduate assistantships (GA), graduate teaching assistantships (GTA), and graduate research assistantships (GRA). GA and GRA appointments are 12 months in duration, and GTA positions are 9 months. Pending continued availability of funds, these positions can be renewed each year for students demonstrating suitable progress toward completion of a thesis and adequately performing duties of the particular position as judged by the advisor/supervisor. Students determined to be inadequately performing as judged by the advisor or those that fail to maintain good academic standing may have their assistantship appointment terminated at any time.

GTA positions in MABE are typically 25% appointments corresponding to ten hours/week of obligation. GTA appointments provide a waiver of university maintenance fees, university health insurance premiums, tuition, and a partial departmental stipend, but no student or activity fees, including fees charged for enrollment in engineering courses. PhD students holding GTA positions typically also receive 25% GRA or GA appointments, corresponding to an additional ten hours/week in performance of GRA or GA duties and providing the remainder of the departmental graduate stipend (but not student or activity fees). Other GRA and GA appointments in MABE are 50% appointments, corresponding to 20 hours/week obligation, providing a waiver of university maintenance fees, university health insurance premiums, tuition, and the full stipend, but not student or activity fees.

Duties of a GTA position commonly include grading and holding office hours. Other duties may be assigned by the faculty supervisor assigned as the responsible instructor for the course. Duties of the GRA depend on the nature of the funded project, but generally coincide with the thesis or dissertation research.

Students are expected to progress continuously through the graduate program in a timely fashion. To encourage steady progress toward the degree, the following limits apply to departmental support:

- Master Degree Candidates: Maximum of two years total support from any source.*
- PhD Degree Candidates who enter with an MS Degree: Maximum of four years total support from any source.*

- PhD Degree Candidates who enter without an MS Degree: Maximum of five years total support from any source.*
- UTK MS Degree Candidates who wish to stay on for the PhD Degree: The student must meet the following criteria to obtain support for a period of up to three additional years from any source:
 - Be admitted to the PhD program.
 - Pass the PhD qualifying examination before consideration for support as a PhD degree candidate.
 - Complete the requirements for the MS degree before receiving support as a PhD student.

* In exceptional cases, support may be extended beyond the stated time limits, if the student's research advisor wishes to use external research funds for this purpose.

Financially supported students are expected to be in residence throughout the calendar year (exceptions are possible for those whose research requires work off-site), engaged in full time study and research, except for university holidays and vacation time of two additional weeks. Note that university holidays do not always correspond with academic breaks (e.g., winter and spring breaks). Absence during these periods applies to vacation time. The university holiday calendar is available online at http://humanresources.tennessee.edu/closing_schedules.html.

Fellowships

A limited number of graduate fellowships are available at the university. See the Graduate School web page for more information (<http://gradschool.utk.edu/gradfund.shtml>). Applicants meeting very strict GPA and GRE standards may be nominated for College of Engineering's Athletic Department Fellowships or the UTK Chancellor's Fellowship by the Graduate Admissions Committee.

Loans

Types of loans administered by the Financial Aid Office are described at <http://finaid.utk.edu/aid/loans/>.

Employment

The assistantship and course work constitute a full-time job. Students holding departmental assistantships may not hold outside employment while on a 50% appointment. Violation of this policy may result in termination of the assistantship. Those on other university assistantships must adhere to the restrictions of those programs. Unfunded students may seek employment on or off campus.

Support for Travel

Travel on university business for which reimbursement will be sought (e.g., to technical conferences) must be approved in advance. See your advisor or the departmental business manager for more information. The Graduate Student Senate administers a Student Travel Fund that may provide funds to support travel to conferences or for other professional purposes. Information is available at <http://web.utk.edu/~gss/travelawards/index.php>.

REGISTRATION AND ADVISING

General Registration Issues

Graduate students must register using the online registration system found through MyUTK (<http://registrar.tennessee.edu/registration.shtml>). Details and academic calendars are available at the Registrar's web site. Students generally must register for each term (Fall, Spring, Summer). Registration typically opens during the preceding term; see the Registrar's web site for the university calendar with registration dates listed.

All students in the BME program holding assistantships should register for 9 – 11 credit hours each semester. Under special circumstances, registration for course loads outside this range may be approved by the Academic Director/DGS and/or iBME Director. Students without assistantships must register for a minimum of 9 credit hours to maintain full-time status and should normally register for 9 – 13 credit hours each semester. Registration for more than 13 hours requires approval of the department head.

BME 500 and BME 600 are appropriate for those students spending significant time performing MS or PhD thesis research, respectively. The bulk of a PhD student's registered course hours in any semester beyond the first year are typically BME 600, as suggested on the sample course registration provided in the appendix. Once a student registers for BME 600, the student must register for this course every term thereafter until graduation.

Students should be aware that course fee reimbursement stemming from withdrawal from a course follows a graduated schedule depending on the date of withdrawal; for example, full fee recovery requires dropping within the first five days of the semester. See <http://onestop.utk.edu> for the full fee recovery schedule.

Advisor Selection

BME PhD students that have accepted graduate research assistantship offers will arrive with an advisor (the faculty member providing the assistantship). For new students not yet assigned an advisor, the Director of Graduate Studies serves as an interim advisor. The DGS will consult with the student upon request and will review the student's experiences, academic background, and interests, and will recommend a program of study for the student's first term.

PhD students and thesis M.S. students should have established a permanent advisor (i.e., major professor) before the end of the first term in residence. The permanent advisor will serve as the chair of the thesis or dissertation committee, direct the research, and advise the student on an appropriate program of study consistent with the student's research interests and long term professional objectives.

Students should submit the advisor assignment form to the iBME Administrative Coordinator to formally establish the advising relationship.

DEGREE REQUIREMENTS

Common Requirements for All BME Graduate Degrees

All students must meet the following requirements for any BME graduate degree:

- Completion of the BME core courses as specified below.
- Participation in BME graduate seminars and registration for BME 595 every semester it is offered.
- Completion of a Specialization Track as specified below.

MS Degree (thesis option)

MS students may choose a thesis-option Master of Science degree. Minimum requirements for the degree are as follows:

- At least 21 credit hours of course work (exclusive of thesis credits) beyond the baccalaureate in biomedical engineering and related areas. A minimum of 12 credit hours of these courses must be in the BME program.
- At least 9 credit hours of thesis research (BME 500).
- Successful completion of a final examination consisting of a written thesis report and oral defense of the thesis.

The Master of Science program culminates with an oral examination in which the student defends the written thesis in a critical examination by the committee. Questions pertinent to the student's course work may also be asked in order to measure the student's ability to integrate the material in the major and related fields of study. This examination must be scheduled, the thesis document distributed to the committee members, and the defense completed consistent with deadlines published in the Graduate Catalog and on the web site of the Graduate School (<http://gradschool.utk.edu/ddategraduation.shtml>). In case of failure, the candidate may not apply for re-examination until the next regularly scheduled examination period. The result of the second examination is final.

Candidates have six calendar years from the time of enrollment in the Graduate School to complete the degree requirements.

MS Degree (non-thesis option)

The standard master's program is the non-thesis option leading to the Master of Science degree. The requirements for completion of the MS degree, non-thesis option, are as follows:

- At least 30 credit hours of course work beyond the baccalaureate in biomedical engineering and related areas. A minimum of 18 credit hours of these courses must be in the BME program.
- Successful completion of a final examination consisting of a written report and/or oral defense on a topic to be chosen in consultation with the student's MS committee.

The student should choose a topic and a committee no later than the semester prior to completing the final examination. The committee will consist of the major professor as chairman and at least two additional iBME faculty holding the rank of assistant professor or above.

A committee meeting should be held promptly at the beginning of the final semester for the purpose of approving the student's topic and outline of the proposed work and work schedule.

The resulting review paper is expected to be equivalent in quality to one of the following documents and could be submitted for consideration for publication with the student and major professor as co-authors:

- A paper to any technical journal approved by the candidate's committee.
- A paper suitable for presentation at any technical meeting approved by the committee.
- A research proposal to an appropriate Institute of the National Institutes of Health or Directorate of the National Science Foundation.

PhD Degree

A total of 72 credit hours beyond the bachelor's degree are required for the PhD degree. These must include a minimum of 24 credit hours in Doctoral Research and Dissertation (BME 600) and a minimum of 36 credit hours of course work. The PhD is first and foremost a research degree, and emphasis is accordingly placed on completion of a high quality research thesis. Research suitable for publication in peer-reviewed technical journals is required, and in most cases multiple publications authored by the PhD candidate are expected prior to awarding of the degree.

Specifically, requirements consist of the satisfactory completion of:

- A minimum of 36 semester hours in graduate level courses (excluding BME 600) in biomedical engineering and related fields beyond the baccalaureate. These courses must include the four core courses and at least 6 hours of courses at the 600 level from the University of Tennessee, Knoxville.
- Completion of BME 601 Doctoral Research Methodology with a grade of B or better.
- The comprehensive examination, consisting of a written part and an oral part. The written part is the dissertation proposal document (see section 6). The defense of the dissertation proposal constitutes the oral portion of the exam.
- A minimum of 24 credit hours of research and dissertation credit in BME 600. Registration must be continuous from the time research begins (see the Continuous Registration requirement in the Graduate Catalog for more information).
- Successful oral defense of the dissertation before the student's dissertation committee.
- Active participation in graduate seminars conducted by the department. Resident students must register for BME 595 or an approved substitute every semester offered.

Core and Elective Courses

The following required courses must be completed by MS and PhD degree students:

- BME 503 (Biological Numerical Methods), Fall semester
- BME 510 (Science Communication), Fall semester - pending
- BME 511 (Biotransport Processes), Spring semester (1st offering will be Spring 2016)
- BME 521 (Applied Quantitative Physiology), Spring semester

All full time graduate students are also required to take BME 595 (Graduate Seminar), or an approved substitute, each semester that it is offered. This 1 credit course may be counted for up to six credits toward the 36 credit course work requirement for the PhD degree. Graduate students conducting their research at an off-campus location sometimes experience difficulty attending the seminars. In these cases, alternative seminars presented at the research site may be substituted by providing documentation for approval by the instructor of record for BME 595.

Each BME student must select one of three Specialization Tracks (Figure 1). Each track includes additional depth and breadth requirements. Courses listed under the Depth Requirements must be completed. One course chosen from the list provided for each track under the Breadth Requirements must also be completed. Students may alter the chosen specialization track during their course study provided they meet the depth and breadth requirements of at least one track by the time the program is completed.

The remainder of the required course work credits may be fulfilled with technical elective courses. Any approved courses listed in the graduate catalog under any engineering or most science programs may be counted as a technical elective with advisor approval. Approved elective sciences include, e.g., math; physics; chemistry; biochemistry, cellular, and molecular biology; microbiology; comparative and experimental medicine. Other courses with substantial technical content may be counted with approval by the advisor and the Director of Graduate Studies. The elective course plan should be developed in consultation with the advisor. Non-thesis M.S. students must choose sufficient credits of these electives from the BME course offerings to meet the minimum 18 credit requirement for the degree.

Students with BS degrees in disciplines other than engineering may need to complete some undergraduate course work in mathematics and/or engineering prior to enrolling in the graduate core courses. Students considering taking these courses should consult the Director of Graduate Studies or other faculty prior to registration in order to establish a customized plan for addressing the necessary background in key topics.

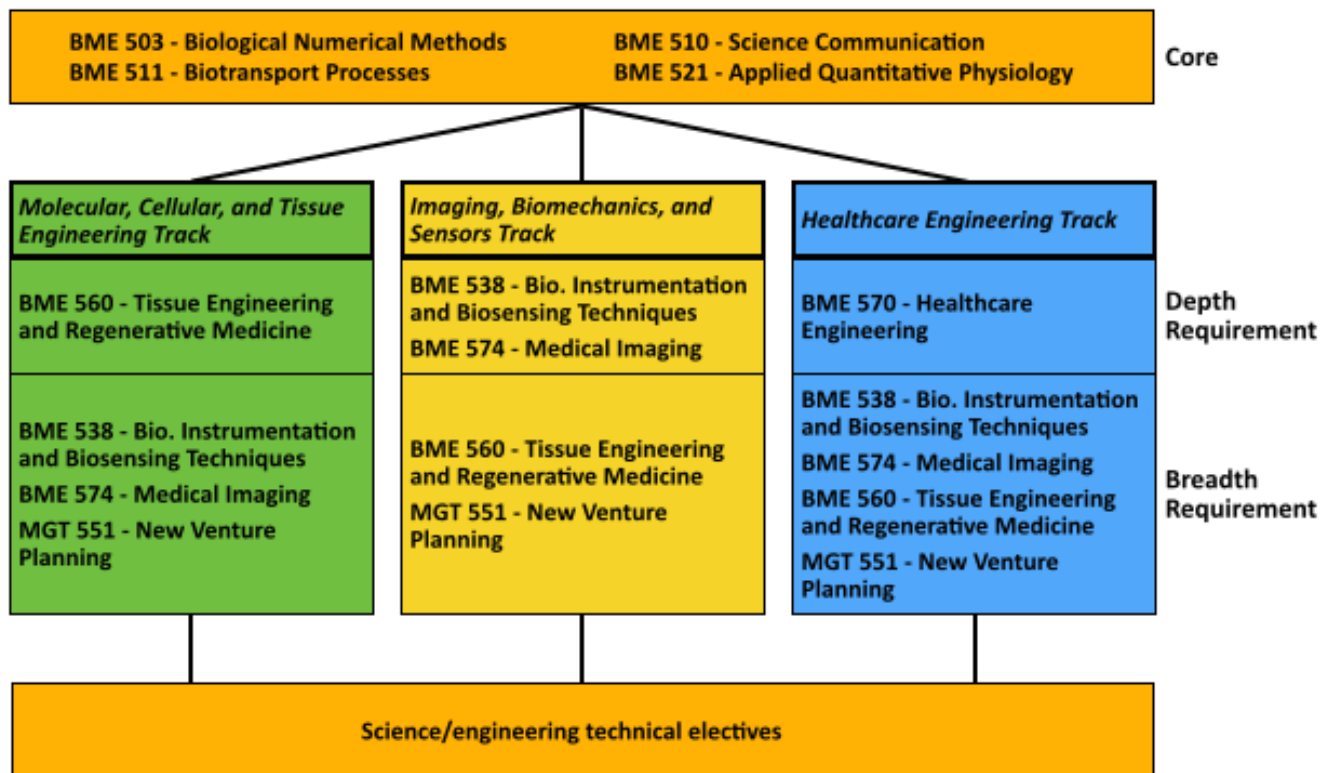


Figure 1. BME graduate course curriculum. Three specialization tracks are available. Choice of the specialization track specifies 1 – 2 required courses for depth and one course chosen from the listed options for breadth.

Minors and Certificates

Additional programs are available to BME graduate students. Participation in these programs requires early planning and should be pursued only with advisor approval. Students not yet assigned a permanent advisor should consult with the Director of Graduate Studies.

- **Intercollegiate Graduate Statistics Program**
MS and PhD students can obtain a minor or a MS in statistics with an MS/PhD in Biomedical Engineering. This requires relatively little additional coursework. All information and requirements at <http://www.bus.utk.edu/stat/igsp/>.
- **Interdisciplinary Graduate Minor in Computational Science**
MS and PhD students can obtain a minor in computational science with an MS/PhD in Biomedical Engineering. This requires relatively little additional coursework. All information and requirements at: <http://igmcs.utk.edu/>.
- **Graduate Certificate in Reliability and Maintainability Engineering**
MS and PhD students can obtain a certificate in Reliability and Maintainability Engineering with the MS/PhD in Biomedical Engineering. This program requires four courses, all of which can count toward the graduate course requirement. All information and requirements at: <http://www.engr.utk.edu/rme/certificate.html>.

- **Dual MS-MBA**
Students may simultaneously pursue an MS in Biomedical Engineering and an MBA. This program requires substantial additional coursework. Information and requirements can be found in the current Graduate Catalog.
- **Non-Thesis MS along the way to a PhD**
Students in the BME PhD program should complete a non-thesis MS during their studies. This requires completing the Request for Concurrent Master's Degree form, found at http://gradschool.utk.edu/forms/RequestforConcurrentMastersDegree_reader.pdf. The course work requirements of the PhD program allow completion of the MS with the addition of a final examination as described under the non-thesis MS requirements above.

Committees

PhD: The major professor directs the student's dissertation research and chairs the dissertation committee. The student and the major professor identify a doctoral committee composed of at least four faculty members holding the rank of assistant professor or above, three of whom, including the chair, must be approved by the Graduate Council to direct doctoral research. At least one member must be from an academic unit other than that of the student's major field. Students are encouraged where appropriate to seek a fifth member in the field of specialization from outside the university to serve on their dissertation committee. This committee is nominated by the department head or college dean and approved by the Dean of the Graduate School. The Dean of the Graduate School must approve the makeup of the committee before the oral part of the comprehensive examination is conducted. The form for approval of the dissertation committee is obtained from the Graduate School web site (<http://gradstudies.utk.edu/gradforms.shtml>).

The student's committee should be formed within two years of entering the program (for full-time students) and should subsequently meet at least once per year to review the student's progress and to discuss the research project. Following the student's admission to candidacy, an annual progress report form must be completed, presented to the committee, and submitted to the iBME office.

MS: Each student must have an advisor (i.e., major professor) from among the iBME faculty, and the student and advisor select a committee. The committee must consist of the advisor and at least two faculty members of the rank of assistant professor or above. The committee's responsibility is to assist the student in planning a course of study and carrying out research for the thesis or non-thesis final exam and to assure that the degree requirements are fulfilled. If the student is pursuing a minor, one member of the committee must be from the minor department.

Application for candidacy must be made as soon as possible after the student has completed required prerequisite courses, if any, and nine hours of graduate course work with a GPA of 3.0 or higher, in all graduate course work. Admission to candidacy confirms that the graduate committee and the Graduate School agree that the student has demonstrated the ability to do acceptable graduate work and that normal progress has been made toward the degree. The student must submit the Admission to

Candidacy form (<http://gradstudies.utk.edu/gradforms.shtml>), signed by the committee members, listing all courses to be used for the degree, to the Graduate School office no later than commencement day of the semester preceding that of graduation. Visit <http://gradschool.utk.edu/ddategraduation.shtml> for the list of deadlines for various expected graduation terms.

EXAMINATIONS

Graduate School requirements related to examinations for graduate degrees are described in the Graduate Catalog.

Final Examination for Non-Thesis MS Students

The Graduate School requires that each non-thesis student must pass a final comprehensive written examination. The examination is not merely a test over course work, but a measure of the student's ability to integrate material in the major and related fields. BME students must submit a critical review of current literature on a selected technical topic for approval by the MS committee, as described above. This written critical review serves as the final exam, in accordance with Graduate School requirements. In addition, the committee may choose to require an oral examination at which the written review is presented and defended. In case of failure, the candidate may not apply for re-examination until the following semester. The result of the second examination is final.

Final Examination for Thesis-Option MS Students

The thesis-option MS program culminates with an oral examination in which the student defends the thesis in a critical examination by the committee. Questions pertinent to the student's course work may also be asked in order to measure the student's ability to integrate the material in the major and related fields of study. This examination must be scheduled and defended consistent with deadlines published in the Graduate Catalog and on the Graduate School web site. The final draft of the thesis must be distributed to all committee members at least two weeks prior to the date of the final examination. In case of failure, the candidate may not apply for re-examination until the following semester. The result of the second examination is final.

Qualifying Exam for PhD Students (BME 601)

All students in the PhD program must pass a qualifying exam prior to proceeding to the thesis proposal and comprehensive exam and being admitted to candidacy. The Graduate Catalog states, "Qualifying examinations are designed to test the student's progress, general knowledge of fundamentals of the field, and fitness to continue with the more specialized aspects of the doctoral program."

Students enrolled in the PhD program normally must take the qualifying exam within the first two years of entering the program. Extensions to this time require prior approval by the student's advisor and the iBME Academic Director.

The qualifying exam will take the form of a three credit hour course, BME 601 (offered every fall and spring semester). This course will require the student to develop a written research proposal in a format matching the NIH F31 Predoctoral Fellowship application (see <http://grants1.nih.gov/grants/guide/pa-files/PA-11-111.html>). This proposal will also be presented orally to a faculty committee. The proposal topic must be determined by the end of the second week of classes in the semester the course is taken and must be approved by the advisor, qualifying exam committee, and the iBME Academic Director. The topic may be related to the student's

doctoral thesis research, or the student may select a different topic. The final draft of the written proposal must be submitted to the student's committee not less than one week before the scheduled oral presentation, and the oral presentation (~25 min plus 20 min for questions) must be completed by the last day of classes. Extensions must be approved in advance by the student's committee and reported to the Academic Director.

Committee: A committee of at least three faculty will be assigned to evaluate the proposal. This committee may or may not become all or part of the student's eventual thesis committee. The committee may include the student's advisor/major professor (recommended). One committee member may be chosen by the student (with the faculty member's consent) and one by the advisor. The third member will be determined by agreement of the first two members. The committee may recruit additional members if they unanimously feel this is warranted, but the three required committee members must all be core or affiliate members of iBME (see <http://ibme.utk.edu/people/faculty/> for a list).

The committee will assess the student's overall qualifications and projected ability to successfully complete original, PhD-level research. This assessment will include:

- The student's ability to demonstrate a thorough knowledge of appropriate subject areas in the proposal.
- The depth, breadth, and feasibility of the proposed research.
- The student's ability to articulate the fundamental science behind the proposed work, as well as answer questions on the science and mathematics in the proposed research and related areas. This will include relevant topics at both the fundamental and advanced levels.
- The student's ability to define and plan doctoral level research.

Outcomes: Students must receive a grade of B or better in BME 601 in order to pass the qualifying exam. In cases where the student fails to meet expectations, the committee may elect to:

1. Issue a failure decision and assign a grade of C or lower in BME 601. This course cannot be retaken, and the student will be dismissed from the doctoral program.
2. Recommend the student revise the proposal and retake the oral exam. In this case, the student will receive an incomplete in BME 601 until the second evaluation is completed. Results of the retaken exam are final and will result in a final grade assigned for BME 601.

In some circumstances, the committee may recommend a conditional pass. Specific conditions assigned by the committee (e.g., completion of additional course work) must be satisfied before the student may complete the thesis proposal and advance to candidacy.

PhD Thesis Proposal

The thesis proposal includes a written research plan and an oral defense of this plan. These elements respectively constitute the written and oral comprehensive examinations specified by the Graduate School and described in the graduate catalog.

The written proposal consists of a well-developed but concise statement, not more than ten pages in length, describing the research to be undertaken along with the research objectives and methodology and an exhaustive review and critique of the related literature. A detailed research plan including the resources required in order to conduct the work and a time table for completion of the proposed research completes the proposal. The final draft of the written proposal must be distributed to the dissertation committee not less than two weeks before the scheduled oral presentation of this research proposal, described below.

Proposals generally require substantial input on the part of the major professor, who participates in guiding the direction the research is expected to take. Some students have found the course English 462 - Writing for Publication - useful in preparing a sound and well-organized proposal. Some advisors recommend that their students take this course for credit during the term during which they are writing their proposal.

The student stands for an oral presentation of the thesis proposal, open to all interested parties, after writing the thesis proposal. The dissertation committee subsequently examines the student in closed discussion. This examination primarily covers the proposed research but may also cover course work completed by the student that is germane to the proposed research. The examination is administered and controlled by the dissertation committee; the committee examines the student and decides if the student passes or fails the defense of the research proposal. Re-examination in cases of failure is at the discretion of the dissertation committee and must be completed within a time frame decided by the committee.

The thesis proposal defense must be completed by the end of the third year in residence and at least 12 months prior to the final dissertation defense. Exceptions for extenuating circumstances must be granted by the iBME Academic Director.

A doctoral student may be admitted to candidacy after passing the thesis proposal, but no later than one full semester prior to completion of the degree requirements. To apply for candidacy, obtain the application form from the Graduate School web site (<http://gradstudies.utk.edu/gradforms.shtml>). The student must have achieved a GPA of at least 3.0 (B) and must have passed both the qualifying exam and thesis proposal in order to be admitted to candidacy. The completed form lists the courses taken, the grades received, and the courses remaining to be completed in order to satisfy degree requirements. The form is submitted to the Office of Graduate Admissions and Records. The Graduate School checks to make sure all the requirements are satisfied and returns approval by email. The date by which you must finish all requirements (eight years after entering the program) will be indicated in the confirmation email.

PhD Dissertation and Final Defense

The dissertation is the permanent record of the results of the original research project, their interpretation, and the conclusions that are drawn from the investigation. The writer points out the novel features of the work and explains in detail how the work was conducted, to the extent that a person skilled in the discipline can repeat the work by reference to the dissertation alone.

Students are encouraged to participate in dissertation workshops, which are announced each term on the Office of Graduate Studies web site, before drafting their document. The format of the dissertation must be approved by The Graduate School. Consultants are available to advise on mechanical details such as margins, page numbering, etc.

The student is required to supply an electronic copy of the final dissertation to the Office of Graduate Studies. The Office of Graduate Studies provides specific information about how this document is to be created and transferred to the library. The major advisor should be given a copy, usually hard bound, and the student should provide copies to the other committee members if requested. These copies may be soft bound.

The final examination of the PhD program is an oral exam in which the candidate defends the dissertation and responds to any related questions the committee may ask.

The dates by which the defense must be scheduled, the dissertation defended, and the dissertation submitted to the Office of the Graduate Admissions and Records in final form are published each semester on the Graduate School web site (<http://gradschool.utk.edu/ddategraduation.shtml>). The candidate normally submits the first draft of the dissertation to the major professor. When the dissertation is acceptable to the major professor, it is presented to the other committee members. The committee must have at least two weeks to read the document in preparation for the final examination, as required by Graduate School policy.

The oral defense consists of a summation of the work, presented to all interested parties, including other graduate students, followed by an examination conducted by the committee in private. The committee decides whether the candidate has passed the examination or not. The dissertation approval sheets are signed by the committee when the document is acceptable in final form, proofread, and corrected. Re-examination in the case of failure is at the discretion of the committee.

STANDARDS, PROBLEMS, AND APPEALS

Maintaining Good Standing

All students must maintain a cumulative GPA of 3.0, in accordance with Graduate School policy. Students falling below 3.0 will be placed on academic probation; if any semester GPA is below 3.0 prior to the cumulative GPA being raised to 3.0 or higher (prompting removal from probation), the student will be dismissed from the university by the Dean of the Graduate School.

Following establishment of a thesis or dissertation committee, each student's progress should be assessed annually by the committee. This assessment should include submission of a short progress report form, provided by the Graduate Assistant, to be signed by the committee members. At the discretion of the committee, an oral presentation of progress may also be required. Unsatisfactory research performance as determined by the committee may result in dismissal from the program.

Academic Integrity

All students are expected to comply with the honor statement signed on the application for admission. Academic or research misconduct by a student will result in dismissal from the program.

Appeals

Appeals of examination decisions should be first discussed with the advisor or major professor and subsequently requested by contacting the Director of Graduate Studies within six months of the examination. The DGS may request that the department head appoint an *ad hoc* committee to further review the initial assessment and issue a decision regarding the appeal. Please refer to the Graduate Council Appeal (<http://gradschool.utk.edu/GraduateCouncil/AcadPoli/appealprocedure.pdf>) and the Hilltopics (<http://dos.utk.edu/hilltopics/>) publications for information regarding appeals of departmental decisions.

APPENDICES

Pertinent Graduate Student Web Pages:

| | |
|--|---|
| Best Practices in Teaching | http://gradschool.utk.edu/orientation/teaching.shtml |
| Center for International Education | http://international.utk.edu |
| Counseling Center | http://counselingcenter.utk.edu |
| Funding for Graduate Students | http://gradschool.utk.edu |
| Graduate School | http://gradschool.utk.edu |
| Graduate Catalog | http://gradschool.utk.edu |
| Graduate Student Appeals Procedure | http://gradschool.utk.edu/studappresrce.shtml |
| Graduate Student Senate | http://web.utk.edu/~gss |
| Graduate and International Admissions | http://admissions.utk.edu/graduate/ |
| International House | http://web.utk.edu/~ihouse |
| Judicial Affairs | http://web.utk.edu/~osja/ |
| Office of Equity and Diversity | http://oed.utk.edu |
| Office of Multicultural Student Life | http://omsa.utk.edu |
| Research Compliance/Research with Human Subjects | http://research.utk.edu/compliance/ |
| International Teaching Assistant Testing Program | http://gradschool.utk.edu/speaktest.shtml |
| Thesis/Dissertation Website | http://web.utk.edu/~thesis/ |
| VolAware | http://volaware.utk.edu |
| Library Resources for Graduate Students | http://www.utk.edu/currentstudents/ |
| Office of Information Technology | http://oit.utk.edu/ |
| Housing | http://gradschool.utk.edu/housing.shtml |
| Dropping Classes (important info on fee rebates) | http://onestop.utk.edu/your-classes/how-do-i-drop-classes/ |
| One Stop Express Student Services | http://onestop.utk.edu |
| Student Fee Information | http://onestop.utk.edu/files/2013/08/grad_tuition_fees-2013.pdf |

Forms and Additional Resources

See the Graduate School Website at <http://gradschool.utk.edu> for important forms.

Additional departmental forms will be posted on the iBME website.

Timeline of Important Deadlines for PhD Students

Dates are indicated for students entering in the fall semester (i.e., the year begins August 1); students entering the program in the spring may be on a different schedule. Extensions of these deadlines must be requested from the Director of Graduate Studies and require advisor approval.

| Date | Year | Time in Residence | Checkpoint |
|---------------|----------------------------------|-------------------|---|
| May | 2 nd | 1.75 | Qualifying exam (completion of BME 601) |
| August | 3 rd | 2.0 | Doctoral committee appointment form |
| By July yr. 3 | 2 nd /3 rd | 1.5 - 3.0 | Thesis proposal (written and oral comprehensive exam) |
| By July | 3 rd | 3.0 | Admission to candidacy form |
| May | 4 th - ? | 3.75 - ? | Annual progress report form |
| --- | 4 th - ? | 3.5 + ? | Defense of dissertation exam |