

**DEPARTMENT OF MECHANICAL, AEROSPACE
AND BIOMEDICAL ENGINEERING (MABE)**

**GRADUATE STUDENT HANDBOOK
MECHANICAL, AEROSPACE AND BIOMEDICAL
ENGINEERING**

Fall 2017

TICKLE COLLEGE OF ENGINEERING

THE UNIVERSITY OF TENNESSEE

KNOXVILLE

**Department Head
Dr. Matthew M. Mench**

**Director of Graduate Studies
Dr. Kivanc Ekici**

**414 Dougherty Engineering Building
Department of Mechanical, Aerospace and Biomedical
Engineering
The University of Tennessee
Knoxville, TN 37996-2210**

Tel.: (865) 974-5115

Fax: (865) 974-5274

E-mail: mabeinfo@engr.utk.edu

URL: <http://www.engr.utk.edu/mabe>

TABLE OF CONTENTS

	Page
1. WELCOME	2
2. INTRODUCTION	2
General University Requirements	2
Honesty and Professionalism	3
Administrative Structure	3
3. ADMISSION REQUIREMENTS AND APPLICATION PROCEDURE	3
4. FINANCIAL SUPPORT	4
Fellowships	4
Graduate Research Assistantships	4
Graduate Teaching Assistantships	4
5. REGISTRATION AND ADVISING	5
6. MASTER OF SCIENCE DEGREE PROGRAM	5
Thesis and Non-thesis Options	6
Thesis Option	6
Non-thesis Option I	7
Non-thesis Option II	8
Rules for Summer Enrollment	8
7. DOCTOR OF PHILOSOPHY DEGREE PROGRAM	9
Academic Advisor (Major Professor) and Proposed Course Plan	9
Departmental Qualifying Examinations	10
Dissertation Research Registration (ME/AE/BME 600)	11
Advisory Committee	11
Dissertation Proposal and Oral Comprehensive Examination	11
Residence Requirement	12
Admission to Candidacy	12
Dissertation	12
Final Oral Examination	12
Rules for Summer Enrollment	13
8. STUDENT APPEALS	13
9. DISMISSAL	13

APPENDICES

	Page
A. FORM FOR ASSIGNMENT OF INITIAL ACADEMIC ADVISOR	15
B. FORM FOR DECLARATION OF ACADEMIC ADVISOR	16
C. FLOW DIAGRAM FOR M.S. PROGRAMS	17
D. PLANNED PROGRAM OF STUDY, M.S. IN ME, AE, OR BME	20
E. FORM FOR M.S. THESIS PROPOSAL	21
F. FLOW DIAGRAM FOR PH.D. PROGRAMS	22
G. PLANNED PROGRAM OF STUDY, PH.D. IN ME, AE, OR BME	24
H. SAMPLE REGISTRATION FORM FOR PH.D. QUALIFYING EXAM	25
I. LINKS TO WEB PAGES	26
J. LINKS TO GRADUATE SCHOOL FORMS	28

1. WELCOME

On behalf of the faculty and staff of the Department of Mechanical, Aerospace and Biomedical Engineering (MABE), welcome to the 2017 edition of the Graduate Student Handbook for graduate programs in Mechanical Engineering, Aerospace Engineering, or Biomedical Engineering.

2. INTRODUCTION

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.

This Graduate Student Handbook for students in Mechanical, Aerospace and Biomedical Engineering should not deviate from established Graduate School policies noted in the Graduate Catalog, which may be found here: [Catalogs](#), but rather provides the specific ways in which those policies are carried out.

General University Requirements

Graduate students are expected to be aware of and satisfy all regulations governing their work and study at the university.

The Graduate Catalog defines the academic requirements associated with graduate study. Only the most significant of these requirements are repeated below. If any of the additional requirements set forth below is in conflict with the Graduate Catalog, **the Graduate Catalog takes precedence.**

Other documents governing various aspects of graduate student rights and responsibilities include Hilltopics and the Graduate Student Appeals Procedure Handbook. Links to these and other publications of the Graduate School may be found at

<http://gradschool.utk.edu/documents/2016/02/student-appeals-procedures.pdf>.

Honesty and Professionalism

The MABE Department adheres to established professional standards of honesty and professionalism. Absolute honesty is expected, and university-wide policies on this subject apply to all students. Professionalism implies a commitment to the application of sound engineering principles for the benefit of humanity. This commitment is expected of all students.

Administrative Structure

The Department of Mechanical, Aerospace and Biomedical Engineering (MABE) offers the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees with majors in Aerospace Engineering (AE), Biomedical Engineering (BME), and Mechanical Engineering (ME). This handbook describes the various policies, rules and regulations pertinent to all three programs and should serve as an aid for both professional and curricular planning.

The ME, AE, and BME graduate programs are administered by the faculty through the department's Graduate Programs Committee (GPC). The chair of the GPC is normally the department's Director of Graduate Studies.

3. ADMISSION REQUIREMENTS AND APPLICATION PROCEDURE

Specific admission requirements are listed below. Admission to the Graduate School does not ensure acceptance into the MABE Department nor admission to candidacy for the degree desired.

Graduate School

Requirements for admission to the Graduate School may be found at [Admissions Requirements](#).

MABE Department

Requirements for admission to the MABE department are listed below.

- Minimum GPA of 3.00 (some exceptions exist).
- The GRE is required of all applicants to the department.
- International students must have at least a "B" average in undergraduate courses from a non-U.S. institute.

Students formally apply for admission to the Graduate School at [Online Application](#).

At UTK, applicants for the M.S. degree in either ME, AE, or BME whose previous degree is not in the major for which admission is requested, are welcome. It is MABE departmental philosophy that the employer of the recipient of a Master of Science degree in ME, AE, or BME will presume a broad-based background in the discipline. Therefore, the Director of Graduate Studies will decide upon a program of ME/AE/BME undergraduate prerequisites appropriate to the student's background at the time of admission. This includes students switching from ME to AE or ME to BME (or vice-versa) for their M.S. programs.

At UTK, applicants for the Ph.D. degree in either ME, AE, or BME whose previous degree is not in the major for which admission is requested, are also welcome. In this case, the degree recipient will probably be employed in research closely allied to the doctoral dissertation area and departmentally specified prerequisites may be inap-

appropriate. The student and his/her advisor will submit a planned program of study for approval to the Director of Graduate Studies.

Each applicant will be advised regarding any courses prerequisite for entering a program. The student's program of study must be approved by his/her advisory committee, the Director of Graduate studies, and must comply with the requirements of the Graduate School.

4. FINANCIAL SUPPORT

Many graduate students receive fellowships, research assistantships or teaching assistantships. The opportunities, stipends and application procedures are summarized below.

Fellowships

Students with a 3.60 GPA in all previous coursework are eligible to apply for a Hilton A. Smith Graduate Fellowship and/or a UT Graduate School Fellowship. Information regarding these fellowships is available through the Office of Graduate Admissions and Records.

MABE departmental fellowships are occasionally available to outstanding applicants. No specific application procedure exists for these fellowships. Opportunities exist for students to apply for fellowships sponsored by their governments, industry, and technical societies. Information regarding these opportunities is posted at the department website, <http://www.engr.utk.edu/mabe>.

Graduate Research Assistantships

Many ME, AE, and BME graduate students are supported with Graduate Research Assistantship (GRA) positions, principally funded by research contracts. A student may be assigned to a research project by mutual agreement with a faculty member who has a position available. The goal is to match the project to the student's interests, and to assign GRAs that correlate with thesis or dissertation activities.

The faculty administering the supporting funds determines the duration of a GRA. The assistantship includes payment of tuition, a monthly stipend and health insurance. Students with exceptional academic performance, especially Ph.D. candidates, are eligible for higher stipends dependent upon funding availability.

Graduate Teaching Assistantships

Graduate Teaching Assistantship (GTA) positions are funded by the department and are normally restricted to doctoral students. These GTAs are normally offered by the department only when a faculty member strongly endorses an incoming student and does not currently have sufficient funds to support the student through their doctoral program. These are for a limited time to allow the faculty member to secure funding for the student's doctoral research. The GTA includes a tuition waiver, monthly stipend and health insurance. Some departmental duties will be assigned for the GTA during the Fall and Spring semesters during which the student is enrolled. There are a very limited number of GTAs available that require students to conduct an undergraduate section of a laboratory course. These are limited to students with good communication skills and who normally have received their B.S. from UTK. Students seeking this GTA should contact the Director of Graduate Studies. ***A GTA is not meant to support the student through graduate school, and a GRA should be sought as soon as possible by the graduate student.***

The Graduate School limits the duration that a student may hold a GTA as follows:

M.S. student: 3 years

Ph.D. student: 5 years after M.S. or 8 years after B.S.

Students holding a half-time assistantship may not simultaneously hold another job. Students holding a quarter-time GTA are eligible to also hold a quarter-time GRA. For further details, the student is referred to the Graduate School document on University Policy for Administration of Graduate Assistantships.

5. REGISTRATION AND ADVISING

Upon admission to the Graduate School and the ME, AE, or BME graduate programs, the graduate student is assigned an Initial Academic Advisor. (See form in the Appendices.) If the student is being funded by a faculty member, this will be his/her Academic Advisor. The student is required, by the end of his/her first term, to select a faculty member to be his/her Academic Advisor, who will also chair the student's advisory committee. (See form in the Appendices.) The student and Academic Advisor will jointly discuss proposed committee members, and the student will then ask these faculty members to serve on the committee. The Academic Advisor will serve as the student's Major Professor and direct the student's non-thesis M. S. course selection, M.S. thesis or Ph.D. dissertation research, **meeting often with the student during the work period**. Other members of the committee may assist in course selection or technical details of the work as needed. The Academic Advisor is primarily responsible for ensuring the quality of the student's work, and hence, must approve the student's thesis or dissertation before it is submitted to the committee. **The ME, AE, or BME student's Academic Advisor must be selected from the faculty of the MABE Department.** All advisory committee appointments are subject to the approval of the MABE Director of Graduate Studies.

6. MASTER OF SCIENCE DEGREE PROGRAM

Suggested curricula for M.S. programs are available at the MABE web site. A flow diagram for M. S. programs is given in the Appendices. The flow diagram refers to the required Planned Program of Study, forms for which are given in the Appendices. The following requirements apply to all M.S. students in the MABE department.

1. Full-time students in the thesis option must register for ME/AE 595 Graduate Seminar for their first Fall semester in attendance.
2. Upon admission to any M. S. program in ME, AE, or BME, the student is assigned an Initial Academic Advisor. (See form in the Appendices.) The Initial Academic Advisor bears no responsibility to advise the student after the first semester. The student is required, no later than the end of the first semester of enrollment, to select a faculty member to be his/her Academic Advisor who will also chair the advisory committee. (See form in the Appendices.) It is the student's responsibility to find, based on common academic interests, a faculty member who will agree to serve in this capacity.
3. The student, in concert with his/her Academic Advisor, must complete the proposed course plan by the **end of the first semester** after entry into the ME, AE, or BME graduate program. The program plan may be changed (in concert with the Academic Advisor) as many times as necessary thereafter.
4. An advisory committee is required and must include at least one faculty member from the MABE department. The department head or GPC Director must approve the membership of the advisory committee, which must be formed no later than the first year of the student's entry into the ME, AE, or BME graduate program.
5. Only courses numbered 400 and above (excluding Math 400) and listed in the Graduate Catalog may be counted toward graduate degrees.
6. No more than 9 hours of courses numbered below 500, including a maximum of one 3-hour course in engineering (only with prior approval), may be counted toward the M.S. degree.
7. A student must be admitted to candidacy for the M.S. degree. The completed Admission to Candidacy form may be submitted to the Office of Graduate Admissions and Records any time after completing at least 9

semester hours of graduate coursework maintaining a GPA of 3.00 or higher. The form must be submitted no later than the semester preceding graduation. (The deadline in each semester is established by the Graduate School and listed at their web site, which is located at [Deadlines.](#))

8. The student must pass a final comprehensive examination. For the thesis option, the examination is based primarily on the student's thesis work, but may include questions on any courses counted toward the degree. The student must schedule the exam through the MABE office. For the non-thesis options, the comprehensive examination is made up of a written examination over all coursework counted for the degree as well as a project report which includes written and oral components.

Thesis and Non-thesis Options

In ME, AE, and BME three M.S. options are offered. Thesis Option requires conducting research under the supervision of an Academic Advisor, writing a thesis, and presentation of the research outcomes to a committee. Non-thesis Option I does not require a thesis and provides graduate students, including co-op and other off-campus students, with the opportunity to focus their programs in special areas through extended coursework. Non-thesis Option II is similar to Non-thesis Option I and does not require a thesis but instead requires one-semester (ME/AE/BME 590) of research on a topic selected by the student's advisor, and requires writing a report and presenting the outcomes of the research to a committee.

Credit requirements for M.S. in ME, AE, and BME are summarized below.

Category	Hours of Credit		
	Thesis Option	Non-thesis Option I	Non-thesis Option II
Thesis hours (ME/AE/BME 500)	≥ 6	0	0
Coursework			
Courses in major (500 or above)	≥ 12	≥ 18	≥ 15
Independent research (ME/AE/BME 590)	0	0	3 or 6
Mathematics (400 or above excluding Math 400)	≥ 6	≥ 6	≥ 6
Engineering courses below 500 (only those courses that are listed in the Graduate Catalog are allowed)	≤ 3	≤ 3	≤ 3
Total credits	≥ 30	≥ 30	≥ 30

Any combination of courses that meets all the requirements listed above and is approved by the student's advisory committee is acceptable.

Thesis Option

In addition to the requirements listed above, the following requirements apply to students under the thesis option.

1. Once thesis work has begun, the student is expected to register for at least 3 semester hours of ME, AE, or BME 500 Thesis each semester (including summer) until graduation. The number of semester hours registered for should reflect the student's activity level. If the student fails to satisfy the continuous enrollment requirement imposed by the Graduate School, he/she will be required to retroactively register for 500 Thesis for those semester(s) that the student missed. Normally, even if the student had a GRA or GTA appointment in the semesters for which continuous enrollment requirement was violated, he/she will be required to pay additional charges for tuition and fees out of pocket. It is

the student's responsibility to ensure that continuous enrollment in Thesis 500 is satisfied and the advisor or the Department is in no way obligated to pay for charges retroactively.

2. At least one semester before the final presentation of the thesis, each M.S. student taking the thesis option must present a thesis proposal for approval by his/her advisory committee and the Director of the GPC. (See form in the Appendices.) The technical scope of the proposal is to be established by the committee. Changes in the technical scope require resubmission of the form in the Appendices.
3. The thesis must be written, must meet the standards of the Graduate School, must demonstrate independent research or design capabilities, and must be approved by the Academic Advisor before the final examination is scheduled. The thesis must be distributed to committee members at least two weeks prior to the final examination.
4. After consulting with the advisory committee, the student schedules the final examination through the MABE Department.
5. The committee conducts the final examination, which is oral and covers the thesis and coursework submitted to satisfy degree requirements. The student's Academic Advisor directs the examination. The examination is held at a convenient time in a comfortable, adequately equipped room. Examination duration will not exceed four hours, and breaks may be taken as needed by the student. The possible outcomes of this examination are described below.
 - i) Pass the examination with the thesis acceptable.
 - ii) Pass the examination subject to making changes in the thesis as specified by the committee. A re-examination is not required.
 - iii) Fail the examination. The student will be given instructions by the committee on the actions necessary to correct deficiencies. A re-examination may be scheduled no sooner than the following semester. Failure to pass the examination on the second attempt will result in the student's dismissal from the M.S. degree program.

The committee records its decision on the Results of Final Examination form (provided by the Graduate School), which is then signed by all members.

6. The student is responsible for obtaining original signatures of all committee members on the approval sheets that must appear at the front of the thesis. (It is best to have these sheets available at the final examination.) After receiving the committee's approval and submitting a copy to the MABE office, the student submits the thesis as well as the Pass/Fail form to the Graduate School.

Non-thesis Option I

As mentioned above (item 8 in the list at the beginning of section 6), each non-thesis student must pass a final comprehensive examination made up of a written examination over coursework as well as a project report which includes written and oral components.

A student's examination committee for the written examination shall consist of the faculty who participate in the preparation and grading of the student's examination. The examination committee will be approved by the Graduate Programs Committee (GPC) early in the term in which the student takes the examination. The faculty comprising the student's advisory committee will be the same as those comprising the student's examination committee. (If the student's advisory committee is appointed before the GPC approves the examination committee, any difference in the membership of the two committees will be resolved by changing the advisory committee to match the examination committee.)

Students who choose this option should register for the written comprehensive exam within the first two weeks of the semester (usually their final semester) that they want to take the exam. The registration form is available through MABE Student Advising Office.

The written examination for non-thesis M. S. students is given in four parts. To pass the examination overall, the student's performance must be acceptable in at least three of the four parts. If the student's performance is acceptable in three parts but unacceptable in the fourth, the decision as to whether the student passes or fails the examination overall is left to the student's examination committee. If the student's performance in some part (or parts) of the examination is neither clearly acceptable nor clearly unacceptable, the examination committee may arrange for one or more oral examinations to clarify the matter. The written examination is given once in each of the Fall and Spring semesters. **A student who will graduate in the summer must take the written exam in the previous spring.**

The project report is normally performed in conjunction with any course taken under a departmental faculty member. This report, which requires some independent study by the student, is normally an extension of material covered in the course. The written report and oral presentation are evaluated by the faculty member teaching the course and are not factors in the student's course grade. The written report and oral presentation are graded on a pass/fail basis and the student's performance is reported to the chair of the student's advisory committee. If a student fails either portion (written report or oral presentation) of the project report, he/she must either work with the faculty member to resolve the deficiency or complete another project in a different course.

Non-thesis Option II

As mentioned above (item 8 in the list at the beginning of section 6), each non-thesis student must pass a final comprehensive examination made up of a written examination that requires a project report and an oral examination that requires presentation of the report to a committee. The students are required to perform research during an entire semester on a topic that is chosen by the student's advisor. Students who choose this option should register for ME/AE/BME 590 in the semester that they are graduating (students graduating in summer should register for the course for the Spring semester). Students are also required to submit a departmental registration form, which is available through MABE Student Advising Office.

A student's examination committee for the written examination shall consist of at least three MABE faculty members. The examination committee will be approved by the Graduate Programs Committee (GPC) early in the term in which the student takes the examination. The faculty comprising the student's advisory committee will be the same as those comprising the student's examination committee. (If the student's advisory committee is appointed before the GPC approves the examination committee, any difference in the membership of the two committees will be resolved by changing the advisory committee to match the examination committee.)

The written report and oral presentation are evaluated by the examination/advisory committee, who will assign a final grade for the ME/AE/BME 590 course the student is registered in. The written report and oral presentation are graded on a pass/fail basis and the student's performance is reported to the Director of Graduate Studies. If a student fails either portion (written report or oral presentation) of the project report, he/she must either work with the faculty member to resolve the deficiency or complete another project.

Rules for Summer Enrollment

If the student is pursuing an M.S. with thesis option and has already started registering for 500 Thesis previously, he/she is required to register for ME/AE/BME 500 during the Summer semesters regardless of his/her appointment as a GRA or GTA. Per university rules, the minimum hours of 500 Thesis should be 3 per semester. If the student fails to satisfy the continuous enrollment requirement imposed by the Graduate School, he/she will be required to retroactively register for 500 Thesis for those semesters that the student missed. Normally, even if the student had a GRA or GTA appointment in the semester(s) for which continuous enrollment requirement was violated, he/she will be required to pay additional charges for tuition and fees out of pocket. It is the student's responsibility to ensure that continuous enrollment in Thesis 500 is satisfied and the advisor or the Department is in no

way obligated to pay for charges retroactively. If the student has not registered for 500 level research previously and is on campus during the Summer semester, he/she should register for ME/AE/BME 502 for a minimum of 3 hours.

If the student is pursuing an M.S. with non-thesis option, and is not conducting research on campus, he/she is not required to register for any credit hours.

The rules above apply to all MABE students. However, there may be additional requirements for international students to ensure that they maintain their legal immigration status. Those students are strongly encouraged to consult with experts in UT's Center for International Education (CIE) and register for proper hours during Summer semesters.

7. DOCTOR OF PHILOSOPHY DEGREE PROGRAM

A flow diagram for Ph.D. programs is given in the Appendices. The flow diagram refers to the required Planned Program of Study, forms for which are given in the Appendices. Specific requirements for the Ph.D. degree include those listed below.

All students must complete a minimum of 72 semester hours beyond the Bachelor's degree. These shall include a minimum of 24 hours in Doctoral Research and Dissertation. Specific requirements for required coursework are:

- Students entering with an M.S. degree will be required to take a minimum of 12 hours of graduate coursework, exclusive of ME, AE, or BME 601, dissertation credit or seminar courses.
- Students entering with a B.S. degree will be required to take a minimum of 42 hours of graduate coursework, exclusive of ME, AE, or BME 601, dissertation credit or seminar courses.

This coursework, including that taken for an M.S. degree, must include:

- A minimum of 9 semester hours of graduate work in mathematics courses numbered 400 or above (excluding Math 400) with a minimum of 3 hours numbered 500 or above. The department may approve other courses with sufficient mathematical content to meet this requirement.
- A minimum of 21 hours of graduate coursework in the major in courses numbered 500 and above. The department may approve other departmental courses to meet this requirement. A minimum of 6 semester hours of graduate coursework is required at the 600 level. These are exclusive of ME, AE, or BME 601, thesis or dissertation credit.
- The total number of approved coursework and dissertation hours must meet the university's requirement of a minimum of 72 hours.

Additional requirements for all students include:

1. Registration for ME, AE, or BME 595 Graduate Seminar for their first Fall semester in attendance.
2. Meeting all departmental examination requirements, which include passing a written and oral comprehensive examination.
3. Presentation of a dissertation proposal to the student's advisory committee and approval of that proposal by that committee.
4. Successful defense of the dissertation.

Academic Advisor (Major Professor) and Proposed Course Plan

After a student is admitted to the ME, AE, or BME doctoral program, the Director of Graduate Studies will assign the student an Initial Academic Advisor for determining the course plan for the first semester. (See form in the Appendices.) If the student is being funded by a faculty member, this will be his/her Academic Advisor. The Initial Academic Advisor bears no responsibility to advise the student after the first semester.

The student is required, no later than the end of the first semester of enrollment in a particular program, to select a faculty member to be his/her Academic Advisor, also referred to as Major Professor, who will direct the student's research and also chair the advisory committee. (See form in the Appendices.) It is the student's responsibility to find, based on common research interests, a faculty member who will agree to serve in this capacity.

The student, in concert with his/her Academic Advisor, must complete the proposed course plan no later than the second semester after entry into the MABE graduate program. The program plan may be changed (in concert with the Academic Advisor) as many times as necessary thereafter.

Departmental Qualifying Examinations

To be admitted to candidacy, a doctoral student must pass a comprehensive examination. In the Mechanical Engineering, Aerospace Engineering and Biomedical Engineering (MABE) Programs the comprehensive examination is made up of two parts: the Qualifying Examination (QE), which itself has a written and an oral part, and the Dissertation Proposal. The Qualifying Examination is discussed below.

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"*.

A student who enters the doctoral program with an M.S. degree will normally take the QE no later than the second semester in the program (not counting Summer semesters). A student who enters the doctoral program without an M.S. degree will normally take the QE in the fourth semester (not counting Summer semesters) in the program. Exceptions to the normal times will require a petition by the student's Major Professor to the Graduate Programs Committee (GPC). The examination may be taken in either the Fall or Spring semester.

In MABE the QE is a 3-credit hour course titled Research Methodology (ME 601, AE 601 or BME 601). A sample registration form for the Ph.D. Qualifying Examination is given in the Appendices. This course will not be lecture based but rather will require the student to develop a written preliminary proposal for a doctoral dissertation (which may or may not be the actual dissertation proposal topic) and to present the proposal orally to a faculty committee, the composition of which is described below. The topic of the proposal is determined by the student and the student's Major Professor subject to the approval of the faculty committee and the GPC. The proposal will include the following as a minimum:

- A concise statement of the problem.
- A thorough review chapter of prior related work with bibliography that is sufficient to judge the uniqueness of the proposed research.
- An assessment of the originality of the proposed topic.
- A chapter including a description of methods to be used to accomplish the work and estimated timeline. The chapter should include adequate depth to indicate the student has a sufficient engineering background to identify and accomplish the research at a doctoral level.
- A chapter describing any preliminary work already accomplished that further establishes the legitimacy of the proposed research (not required).

A committee of faculty will be appointed to evaluate the written proposal and conduct the oral presentation. This committee, as a minimum, will be made up of the Major Professor, a member (or two members if deemed appropriate) nominated by the student and the Major Professor subject to the approval of the GPC, and a member selected by the GPC. This committee should be comprised of only MABE faculty (including tenured, tenure-track, non-tenure track, and adjunct faculty as well as lecturers), and may or may not be the student's actual doctoral committee. The committee will assess:

- 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, organize and plan doctoral level research.

The Major Professor will report the grade recommended by each committee member to the GPC which will determine the student's final grade in the QE. A grade of B or better in the course is required to pass the QE, which will not count toward the required coursework for the PhD. A grade below a B indicates the student has failed the QE and will be dismissed from the doctoral program (i.e. the course cannot be repeated). The faculty committee may propose a final grade of incomplete, subject to GPC review and approval, for those cases where the student has completed the majority of the requirements, but has some deficiencies in particular areas. In such cases, the student will be allowed one more semester (counting Summer semester) to complete the course requirements. Under extenuating circumstances the Major Professor may petition the GPC for an additional amount of time.

The QE, in its core, is like any other examination, and therefore, work must be performed individually by the student. While very limited guidance can be provided by the student's Academic Advisor throughout the proposal writing process, extensive help and coaching by the advisor is not permitted.

Dissertation Research Registration (ME/AE/BME 600)

Once a Ph.D. student passes his/her qualifying exam, they are expected to start doing full-time research. Therefore, the semester following the qualifying exam, the student should start registering for dissertation hours (ME/AE/BME 600). Students are strongly discouraged from registering for ME/AE/BME 600 **before** passing the qualifying exam. It must be noted that, per university rules, once a student starts registering for 600-level dissertation hours he/she must continue to register in every semester (including summers) until he/she graduates. It is the student's responsibility to ensure that this requirement is met.

Advisory Committee

An advisory committee is required and must be formed during the student's first twelve months of doctoral study. The department head at UTK must approve the membership of the committee. The committee must include at least **four** faculty members, **with at least two from the MABE department and at least one from outside the department**. The chair of the advisory committee of students majoring in ME, AE, or BME must be in the MABE Department. *At least three members of the committee, including the chair, must be approved to direct doctoral research.*

Dissertation Proposal

All Ph.D. graduate students must complete original research as a degree requirement. The student must prepare a comprehensive proposal that defines the dissertation research project. This proposal, when approved by the student's advisory committee, serves two purposes. First, approval indicates that the advisory committee agrees that the content and scope of the proposed research are appropriate. Second, the student has a formal agreement, which specifies a lower limit on the level of accomplishment required to satisfy the dissertation requirements. The proposal includes the following:

- A concise statement of the problem,
- A review of prior related work,
- An assessment of the originality of the proposed topic,
- A description of methods to be used to accomplish the work,
- A list of fundamental contributions expected,
- An estimated schedule of performance,
- A statement of the method by which the residency requirement will be met, and
- A bibliography pertinent to the topics of the proposed research.

The Academic Advisor may arrange an informal meeting with committee members, prior to the formal oral examination and proposal presentation, so that the student can respond to committee members' questions about the proposal.

Approval by the student's advisory committee of the written dissertation research proposal and the accompanying oral presentation are required for admission to candidacy for the Ph.D. degree.

If, for whatever reason, the scope of the proposed research deviates from the original proposal, a revised proposal must be submitted and approved.

Residence Requirement

The Graduate School requires a period of two consecutive semesters of residence. During this time, the student should make substantial progress toward the degree. The type of residence experience is determined by the student's advisory committee in the spirit of fulfilling the Graduate Council's definition of residence. A statement of how and when the requirement was met is included on the Admission to Candidacy form, and the department head at UTK certifies that the objectives of the residence requirement have been met.

Admission to Candidacy

For the Ph.D. degree the student must be admitted to candidacy by the Graduate School. The application form must be completed, signed by the student's advisory committee, signed by the director of graduate studies of MA-BE, and then submitted to the Graduate School by their deadline in the semester preceding anticipated graduation.

Dissertation

The Academic Advisor must approve a dissertation, written to the standards of the Graduate School, before the final oral examination is scheduled. The completed dissertation draft must be submitted to all committee members at least two weeks prior to the oral examination.

Final Oral Examination

In consultation with the committee, the student formally schedules the final oral examination through the Graduate School.

The student's advisory committee conducts the final oral examination, which is open to the University community at large and covers the dissertation and all coursework submitted to satisfy degree requirements. The examination is managed by the student's Academic Advisor, and will be scheduled at a convenient time in a comfortable, adequately equipped room. Examination duration will not exceed four hours, and breaks may be taken as needed by the student. The possible outcomes of this examination are described below.

- i) Pass the examination with the dissertation acceptable.
- ii) Pass the examination subject to completing minor changes in the dissertation as specified by the committee. A re-examination is not required.
- iii) Fail the examination. The student will be given instructions by the committee on the actions necessary to correct the deficiencies in the dissertation or examination. A re-examination may be scheduled no sooner than the following semester. Failure to pass the examination on the second attempt will result in the student being dismissed from the Ph.D. degree program.

The committee records its decision on the Results of Final Examination form, provided by the Graduate School, which is signed by all members when the oral defense of dissertation is accepted.

The student is responsible for obtaining original signatures of all committee members on the approval sheets that must appear at the front of the dissertation. (It is best to have these sheets available at the final examination.) After receiving the committee's approval, the student submits the dissertation to the Graduate School for their approval regarding form and organization.

Rules for Summer Enrollment

As explained in the earlier parts of this document, if the student has already started registering for 600 Dissertation hours previously, he/she is required to register for ME/AE/BME 600 during the Summer semesters regardless of their appointment as a GRA or GTA. Per university rules, the minimum hours of 600 dissertation should be 3. If the student fails to satisfy the continuous enrollment requirement imposed by the Graduate School, he/she will be required to retroactively register for 600 Dissertation for those semesters that the student missed. Normally, even if the student had a GRA or GTA appointment in the semester(s) for which continuous enrollment requirement was violated, he/she will be required to pay additional charges for tuition and fees out of pocket. It is the student's responsibility to ensure that continuous enrollment is satisfied and the advisor or the Department is in no way obligated to pay for charges retroactively. If the student has not registered for 600-level research previously and is on campus during the Summer semester, he/she should register for ME/AE/BME 502 for a minimum of 3 hours.

The rules above apply to all MABE students. However, there may be additional requirements for international students to ensure that they maintain their legal immigration status. Those students are strongly encouraged to consult with experts in UT's Center for International Education (CIE) and register for proper hours during Summer semesters.

8. STUDENT APPEALS

Grievances regarding any policy or action by the University or its personnel may be presented according to the Graduate Council Appeals Procedure, which is available from the Graduate School. Complaints regarding the MABE department, or its personnel, should be addressed directly to the MABE department head at UTK. The student may request a meeting with his/her Academic Advisor, the Director of the Graduate Programs Committee, the department head, and/or any other department personnel involved in a dispute. If a resolution satisfactory to the student cannot be achieved within the department, the student may present his/her case to the dean of the college, and then to the dean of the Graduate School.

9. DISMISSAL

The following statement can be found in the Graduate Catalog under the heading Academic Standards.

"Graduate education requires continuous evaluation of the student. This includes not only periodic objective evaluation, such as the cumulative grade point average, performance on comprehensive examinations and acceptance of the thesis or dissertation, but also judgments by the faculty of the student's progress and potential. Continuation in a program is determined by consideration of all these elements by the faculty and the head of the academic unit."

In keeping with the above policy, the faculty of the MABE department will periodically evaluate the progress and potential of MABE graduate students. Particular attention will be given to the following requirements and factors, which are among those for which the GPC may recommend to the department head the dismissal of a graduate student.

The student has not obtained an Academic Advisor by the end of the first semester of enrollment in the ME, AE, or BME graduate program.

The student has not formed a faculty advisory committee within twelve months of beginning the program.

The student has not submitted an approved plan of study within one semester (M. S.) or two semesters (Ph. D.) of beginning the program.

The student has not made reasonable progress toward completion of the plan of study.

A doctoral student has not taken the Qualifying Examination by the deadline specified in the Graduate Student Handbook.

In the judgment of the Graduate Programs Committee, in consultation with appropriate faculty, the student does not have the potential to complete his or her degree program.

APPENDIX A. ASSIGNMENT OF INITIAL ACADEMIC ADVISOR

I, _____, having been admitted to the
(PRINT NAME)

_____ M. S.

_____ Thesis

_____ Non-Thesis

_____ Ph. D.

program in

_____ Mechanical Engineering

_____ Aerospace Engineering

_____ Biomedical Engineering

at the University of Tennessee

_____ Knoxville

_____ UTSI

campus, understand that Dr. _____ has been assigned to be my Initial Academic Advisor. I understand that he/she is to advise me on course selection and other academic matters only for my first term in the program. **By the end of the first term I am to have established a relationship with a faculty member who agrees to serve as my Academic Advisor.** Identification of my Academic Advisor is required for continuation in the program.

Student Signature

Date

Student ID

Director of Graduate Studies

Date

APPENDIX B. DECLARATION OF ACADEMIC ADVISOR (MAJOR PROFESSOR)

I, _____, have asked Dr. _____
(PRINT NAME) (PRINT NAME)

to serve as my Academic Advisor, and he/she has agreed to do so. I understand that if I should change my Academic Advisor in the future, I must resubmit this form. Having an Academic Advisor is required for continuation in the ME, AE, or BME graduate program.

Student Signature Date

Student ID

Academic Advisor (Major Professor) Date

Director of Graduate Studies Date

_____ Mechanical Engineering

_____ Aerospace Engineering

_____ Biomedical Engineering

_____ M. S.

_____ Thesis

_____ Non-Thesis

_____ Ph. D.

APPENDIX C. FLOW CHART FOR M. S. PROGRAMS

Master's students normally follow the sequence of events given below. The student should consult with his/her Academic Advisor before deviating from this sequence.

Date	Step	Action	Notes
1st term	1	Initial Academic Advisor assigned by Graduate Programs Committee (GPC).	The GPC assigns an Initial Academic Advisor. If you are being funded by a faculty member, that will be your assigned advisor. You may change advisors as you define your program, but you must have an advisor approved by the GPC.
1st term	2	Obtain Academic Advisor (Major Professor).	It is the student's responsibility to establish a relationship with a faculty member, based on having academic interests in common, who agrees to serve as the student's Academic Advisor (Major Professor).
1st term	3	Select degree option: thesis/non-thesis.	The student has three options: thesis option, non-thesis option I, and non-thesis option II. The student's advisor will lead the student through the evaluation of potential options.
1st term	4	Develop program of study (see Appendices).	The student and his/her Academic Advisor should develop a course of study plan that satisfies all university and department requirements during the first semester. This plan must be submitted to the student's advisor and the Director of Graduate Studies for approval.
1st term	5	Select research/problem topic.	The topic selected is based primarily on the student's professional/career interests and goals. The topic is determined by the student's Academic Advisor.

Date	Step	Action	Notes
	5a	Revise course of study plan if appropriate.	Selection of topical emphasis may necessitate modifying the original plan. The revised Planned Program of Study for M.S. (see Appendices) must be approved by the student's advisor and the Director of the GPC.
1st year	6	Choose advisory committee; file for admission to candidacy.	The student's committee is selected in concert with the Academic Advisor. The committee must have at least three members. Submit an Admission to Candidacy Application with approval of the student's advisory committee and Department Head. This form shows course work that will be used to fulfill the degree course requirements.
	7	Develop, submit and present thesis/selected problem proposal.	Proposal should be developed in concert with the Academic Advisor. Proposal must be submitted in writing and presented orally to the advisory committee for approval.
	8	Take courses and perform research.	A 3.00 GPA is required for graduation. Normally, ME/AE/BME majors may use no more than one 400-level engineering course to meet minimum course requirements. Transferable credits are determined by the student's Advisory Committee and approved by the Director of Graduate Studies. A student should register for 500 Thesis when he/she starts to work on his/her thesis. The student must be enrolled in 500 Thesis in the semester of graduation.
	9	Submit thesis for review and approval.	Thesis should be submitted to the advisory committee two weeks prior to the date of the final examination.

Date	Step	Action	Notes
	10	Make arrangements for, and schedule, final examination.	For non-thesis option I, the students should register for the MS comprehensive exam at the beginning of the semester that they want to graduate (or the semester that they want to take the exam). The exam is offered only in the Fall and the Spring, and the registration form is available through the MABE Student Advising Office. For the thesis option and non-thesis option II, schedule the exam through the MABE office at least one week before the date of the examination. A written report on problems shall be available to the student's committee two weeks before the final examination. Students taking the oral examination (thesis option and non-thesis option II) must notify the MABE faculty one week in advance. This announcement must be made in writing.
	11	Take final examination.	Defense of thesis or course work conducted before the committee. A written examination, scheduled by the GPC, is required for non-thesis students.
	12	Pay graduation fees.	
	13	Submit thesis for review and approval.	Thesis must be approved and accepted and final examination reports must be submitted to Graduate Records. For deadlines for each semester, consult Graduation Deadlines
	14	Clear any financial obligations with UTK. Attend Chancellor's reception.	The university is authorized to withhold a student's diploma and transcript for any outstanding fees at the time of graduation.
	15	Attend graduation.	Commencement ceremonies are held each semester except in summer. Contact the Graduate School for dates and information on graduation schedules and procedures.

APPENDIX D. PLANNED PROGRAM OF STUDY, M. S. IN ME, AE, or BME

Name: _____ Student ID: _____

Advisor: _____ Date: _____

Three MS options are offered.

Thesis Option requires a thesis (*ME/AE/BME: 24 hours coursework and 6 thesis hours*).

Non-thesis Option I does not require a thesis (*ME/AE/BME 30 hours coursework and a comprehensive exam*).

Non-thesis Option II does not require a thesis (*ME/AE/BME 30 hours coursework including ME/AE/BME 590 that requires independent research with report followed by an oral exam*).

Fill in the course plan using the requirements below.

No.	Course	Title	Semester	Grade
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Choose one: Thesis Option Non-thesis Option I Non-thesis Option II

	Thesis Option	Non-thesis Option I	Non-thesis Option II
Courses in major (with letter grade)	12 cr. hrs. min. required	18 cr. hrs. min. required	15 cr. hrs. min. required
Other coursework (with letter grade)	6 cr. hrs.	6 cr. hrs.	6 (or 3) cr. hrs.
ME/AE/BME 590	0 cr. hr.	0 cr. hr.	3 (or 6) cr. hrs.
Math 4xx or 5xx (excluding Math 400)	6 cr. hrs. min. required	6 cr. hrs. min. required	6 cr. hrs. min. required
Total coursework	24 cr. hrs. min. required	30 cr. hrs. min. required	30 cr. hrs. min. required
ME/AE/BME 500 Thesis	6 cr. hrs. min. required	0 cr. hr.	0 cr. hr.

Coursework may include following 4xx level courses listed in the Graduate Catalog:

Engineering courses 4xx (max. 3 cr. hr.) _____ hours
 Total 4xx courses (max. 9 cr. hr.) _____ hours

 Student Signature Print Name Date

 Academic Advisor (Major Professor) Print Name Date

 Director of Graduate Studies Print Name Date

APPENDIX E. MASTER'S THESIS PROPOSAL OUTLINE
(No more than two pages. Include headings as shown.)

Student:

Proposed Thesis Title:

Date Submitted:

Problem Definition

Provide short background/introductory information.
Describe the essential scope of the work to provide insight into the magnitude of the required effort.

Thesis Significance

Define the key challenges in the proposed work.
Discuss the engineering significance of the proposed work.

Schedule

Define major tasks/activities.
Define key milestones.
Display time-line in a Gantt chart.

Approvals

Student Signature Date

Academic Advisor (Major Professor) Date

Thesis Committee Member Date

Thesis Committee Member Date

Thesis Committee Member Date

Director of Graduate Studies Date

APPENDIX F. FLOW CHART FOR PH.D. PROGRAMS

Doctoral students normally follow the sequence of events given below. The student should consult with his/her Academic Advisor (Major Professor) before deviating from this sequence.

Date	Step	Action	Notes
1st term	1	Initial Academic Advisor assigned by Graduate Programs Committee (GPC).	The GPC assigns an Initial Academic Advisor. You may change advisors as you define your program, but you must have an advisor approved by the GPC. If you are being funded by a faculty member, that will be your assigned advisor.
1st term	2	Obtain Academic Advisor (Major Professor).	It is the student's responsibility to establish a relationship with a faculty member, based on having research interests in common, who agrees to serve as the student's Academic Advisor (Major Professor). This must be done by the end of your first semester.
	3	Develop program of study (see Appendices).	During the second semester, the student and his/her Academic Advisor should develop a course of study plan that satisfies all university and department requirements. This plan must be submitted to the student's advisor and the Director of Graduate Studies for approval.
	4	Register for and take departmental qualifying examinations.	The student and his/her Academic Advisor should select an appropriate topic for the qualifying examination. Relevant information is given in Section 7 and the appendices of this handbook.
1st year	5	Form advisory committee.	An advisory committee is required and should be formed in consultation with the Academic Advisor during the student's first year of doctoral study. The membership of the committee must be approved by the department head. The committee must include at least four faculty members, with at least one from the MABE department and at least one from another department. The Academic Advisor and at least two other members of the committee must be approved to direct doctoral dissertation research.
	6	Select research topic.	The topic selected is based primarily on the research interests shared by the student and his/her Academic Advisor (Major Professor).

Date	Step	Action	Notes
	7	Prepare and present dissertation proposal.	Guidelines are given earlier in this handbook.
	8	Conduct research, satisfy University's residency requirement.	The residency requirement is described in the Graduate Catalog.
	9	File for admission to candidacy.	Submit an Admission to Candidacy Application with approval of the student's advisory committee and the department head.
	10	Complete research and write dissertation.	Guidelines are given in the Graduate Catalog.
	11	Submit dissertation to advisory committee for review.	Should be submitted two weeks prior to the date of the final examination.
	12	Make arrangements for and schedule final examination.	File Recommended Arrangements for Final Examination form with the Graduate School. This form must be filed at least one week before the date of the examination.
	13	Defend dissertation.	Oral presentation and defense of dissertation conducted before the advisory committee.
	14	Pay graduation fees.	
	15	Submit dissertation to graduate school.	Dissertation must be approved and accepted and final examination reports must be submitted to Graduate Records. For semester deadlines, consult Graduation Deadlines
	16	Clear any financial obligations with UTK. Attend Chancellor's reception.	The university is authorized to withhold a student's diploma and transcript for any outstanding fees at the time of graduation.
	17	Attend graduation.	Commencement ceremonies are held each semester except in summer. Contact the Graduate School for dates and information on graduation schedules and procedures.

APPENDIX G. PLANNED PROGRAM OF STUDY, PH.D. IN ME, AE, or BME

Name: _____ Student ID: _____

Advisor: _____ Date: _____

No.	Course	Title	Semester	Grade
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

Math 400 or above (excluding Math 400)	(9 cr. hr. min required; 3 cr. hr. min. at 500-600 level)	_____ hours
Courses in major	(21 cr. hr. min. required)	_____ hours
Department courses 6xx	(6 cr. hr. min. required)	_____ hours
Other coursework	(12 cr. hours)	_____ hours
Dissertation	(24 cr. hr. min. required)	_____ hours

ME/AE/BME : All students must complete a minimum of 72 graduate semester credit hours beyond the bachelor's degree. These must include a minimum of 24 credit hours in Doctoral Research and Dissertation.

Student Signature _____ Print Name _____ Date _____

Academic Advisor (Major Professor) _____ Print Name _____ Date _____

Director of Graduate Studies _____ Print Name _____ Date _____

APPENDIX H. SAMPLE REGISTRATION FORM FOR PH.D. QUALIFYING EXAMINATION

I hereby request to take the PhD Qualifying Examination during:

Fall Spring semester, 20__ and

request enrollment in ME 601 AE 601 BME 601 (check one).

The subject area of the proposed topic is:

The engineering topics in the proposed area are (e.g. Heat Transfer, Control Systems, Vibrations, etc. Must contain at least two areas.):

Student (print) Student (sign) Date

Major Professor (print) Major Professor (sign) Date

Recommended Committee Member(s) (one or two):

The above form is to be submitted to the Chair of the Graduate Programs Committee (GPC).

Director of Graduate Studies Date

GPC-appointed Committee Member Date

Qualifying Exam Schedule:

Room: _____

Date: _____ Time: _____

Pass Fail

APPENDIX I. LINKS TO 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>

MABE Department and College

<http://mabe.utk.edu>

College of Engineering

<http://www.engr.utk.edu/>

Funding, Fellowships, Assistantships for Graduate Students

<http://gradschool.utk.edu/gradfund.shtml>

Graduate School

<http://gradschool.utk.edu>

Graduate Catalog

<http://catalog.utk.edu/index.php>

Graduate Student Appeal and Complaint Procedures/Resources <http://gradschool.utk.edu/graduate-student-life/understanding-your-rights-and-obligations/>

Graduate Student Senate

<http://gss.utk.edu>

Graduate and International Admissions

<http://graduateadmissions.utk.edu>

International House

<http://ihouse.utk.edu>

Office of Student Conduct and Community Standards

<http://studentconduct.utk.edu>

Office of Equity and Diversity

<http://oed.utk.edu>

Office of Multicultural Student Life

<http://multicultural.utk.edu>

Research Compliance/Research with Human Subjects

<http://research.utk.edu/compliance/>

ACTFL OPIc Testing Program (Formerly the SPEAK Testing Program)

<http://gradschool.utk.edu/graduate-student-life/ita-testing-program/>

Thesis/Dissertation Website
<http://web.utk.edu/~thesis/>

Center for Health Education and Wellness (Formerly VolAware)
<http://wellness.utk.edu>

Library Website for Graduate Students
<http://libguides.utk.edu/graduate>

OIT – Office of Information Technology
<http://oit.utk.edu/>

Housing
<http://housing.utk.edu/students/halls/apartment/>

APPENDIX J. LINKS TO GRADUATE SCHOOL FORMS

Graduate Student Deadline Dates

<http://gradschool.utk.edu/graduation/graduation-deadlines/>

Admission to Candidacy Application – Master’s Degree

<http://gradschool.utk.edu/forms-central/admission-to-candidacy-masters-or-specialist-degree/>

Doctoral Committee Appointment Form

<http://gradschool.utk.edu/forms-central/doctoral-committee-form/>

Admission to Candidacy Application – Doctoral Degree

<http://gradschool.utk.edu/forms-central/admission-to-candidacy-doctoral-degree/>

Scheduling Defense of Dissertation Form

<http://gradschool.utk.edu/forms-central/schedule-of-dissertation-defense/>

Graduate Student Travel Award Forms (specific to department, college, and university) <http://gss.utk.edu/travel-awards/>