

# **GRADUATE STUDENT HANDBOOK**

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**DEPARTMENT OF MECHANICAL, AEROSPACE  
AND BIOMEDICAL ENGINEERING**

**COLLEGE OF ENGINEERING**

**THE UNIVERSITY OF TENNESSEE  
KNOXVILLE**

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## **1. INTRODUCTION**

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), Engineering Science (ES), and Mechanical Engineering (ME). This handbook describes the various policies, rules and regulations pertinent to these programs and should serve as an aid for both career and curriculum planning.

## **2. GENERAL UNIVERSITY REQUIREMENTS**

The *Graduate Catalog* defines the university requirements associated with graduate study. Only the most significant of these requirements are repeated below. Hence, students are referred to the Graduate Catalog for information about Graduate School requirements and privileges. *If any of the additional requirements set forth below is in conflict with the Graduate Catalog, the Graduate Catalog takes precedence.* The student is encouraged to become familiar with the university's statement of *Graduate Student Rights and Responsibilities*. Further information may be found at the web site for the Graduate School, <http://gradschool.utk.edu/default.shtml>.

## **3. 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.

## **4. ADVISING**

Upon admission to the Graduate School and the MABE graduate programs, the graduate student is assigned an Initial Academic Advisor. (See form in Appendix A.) 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 advisory committee. (See form in Appendix B.) 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 AE, BME or ME student's Academic Advisor must be selected from MABE Department. The ES student's Academic Advisor may be selected from a department other than MABE; however, at least one member of the student's graduate advisory committee must be an MABE faculty member. All advisory committee appointments are subject to the approval of the MABE department head at UTK.

## 5. 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 Appendix C. The flow diagram refers to the required Planned Program of Study, forms for which are given in Appendices D and E. The following requirements apply to *all* M.S. students in the MABE department.

1. Full-time students must register each fall and spring for ME/AE/BME/ES 595 Graduate Seminar.
2. Upon admission to any M. S. program in MABE, the student is assigned an Initial Academic Advisor. (See form in Appendix A.) 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 Appendix B.) 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 MABE 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 MABE graduate program.
5. Only courses numbered 400 and above and listed in the Graduate Catalog may be counted toward graduate degrees.
6. No more than 10 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 course work 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 <http://gradschool.utk.edu/default.shtml>.)

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 option, the examination will cover all course work counted for the degree. The GPC schedules the exam each term.

### Thesis and Non-thesis Options

In ME, AE, BME and ES, two M.S. options are offered. Option I requires a thesis. Option II 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.

Credit requirements for M.S. in ME/AE are summarized below.

	Option	Hours of Credit	
		Thesis	Non-thesis
Thesis .....		6	0
Course Work		24	30
Courses in major (500 or above).....		(12 min)	(18 min)
Mathematics (400 or above).....		(6 min)	(6 min)
Engineering courses (500 or below).....		(3 max)	(3 max)
ME 590 or AE 590.....		(0)	(6 max)
	Total	30	30

Credit requirements for M.S. in BME are summarized below.

	Option	Hours of Credit	
		Thesis	Non-thesis
Thesis.....		6	0
Course Work.....		24	30
Engineering courses (Major concentration may include but is not restricted to courses offered by the dept.).....		(12 min)	(15 min)
Mathematics (400 or above).....		(6 min)	(6 min)
Related courses (May include courses in mathematics, computer science, or the physical and life sciences as well as engineering).....		(6 max)	(9 max)
BME 590.....		(0)	(6 max)
	Total	30	30

Credit requirements for M.S. in ES are summarized below.

	Option	Hours of Credit	
		Thesis	Non-thesis
Thesis.....		6	0
Course Work.....		24	30
Engineering courses (Major concentration may include but is not restricted to courses offered by the dept.).....		(12 min)	(15 min)
Mathematics (400 or above).....		(6 min)	(6 min)
Related courses (May include courses in mathematics, computer science, or the physical and life sciences as well as engineering).....		(6 max)	(9 max)
ES 590.....		(0)	(6 max)
	Total	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 AE/BME/ES/ME 500 Thesis each semester until graduation. The number of semester hours registered for should reflect the student's activity level. Co-op students following the thesis option do not need to register for 500 Thesis during the semesters they work.

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 (both written and oral) for approval by his/her advisory committee and the Director of the GPC. (See form in Appendix F.) The technical scope of the proposal is to be established by the committee. Changes in the technical scope require re-submission of the form in Appendix F.
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 course work 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, the student submits the thesis to the Graduate School.

### **Non-thesis Option**

As mentioned above (item 8 in the list at the beginning of section 6), each *non-thesis* student must pass a written final comprehensive examination. The exam is given once in each of the fall and spring semesters. A student who will graduate in the summer must take the exam in the previous spring.

A student's examination committee for the written comprehensive 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.)

The written comprehensive examination for nonthesis 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.

## **6. DOCTOR OF PHILOSOPHY DEGREE PROGRAM**

A flow diagram for Ph.D. programs is given in Appendix G. The flow diagram refers to the required Planned Program of Study, forms for which are given in Appendices H and I. 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, exclusive of credit for the master's thesis. These shall include a minimum of 24 semester hours of AE/BME/ES/ME 600 Doctoral Research and Dissertation and a minimum of 48 semester hours in other courses.

In ME, AE or BME the courses must include:

1. A minimum of 12 semester hours of graduate credit in mathematics in courses numbered 400 or above, with a minimum of 6 semester hours numbered 500 or above.
2. A minimum of 24 semester hours in the MABE department in courses numbered 500 and above, with at least 12 of these semester hours in the major. A minimum of 9 semester hours of courses is required at the 600 level. These are exclusive of thesis, problems, or dissertation credit. The student's advisory committee can approve a student's petition to replace one 600-level course with one or more 500-level courses(s) that are appropriate.

In ES, the courses must include:

1. A minimum of 24 semester hours in engineering graduate courses, exclusive of thesis and dissertation credit. These courses will normally be numbered 500 and above, with at least 9 semester hours of 600-level courses, which constitute one or two areas of concentration selected by the student. The

number of courses in this group to be taken will depend on the program selected by the student and the approval of his/her advisory committee.

2. A minimum of 12 semester hours in mathematics or computer science in courses numbered 400 and above.

Additional requirements for all students include:

1. Full-time students must register each semester for AE/BME/ES/ME 595 Graduate Seminar.
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 any MABE doctoral program, the Director of the GPC will assign the student an Initial Academic Advisor for determining the course plan for the first semester. (See form in Appendix A.) 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 Appendix B.) 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**

After being admitted to the MABE doctoral program, a student must take a Qualifying Examination at the first offering after the end of the student's first semester at UTK if he/she has a master's degree or completed 24 semester hours of graduate course work. The primary purpose of the qualifying examination is to determine the academic qualifications of the student to continue in the Ph.D. program.

- The written portion of the exam will be given at a common time. Three subjects, chosen by the student and his/her advisor, will be examined. Emphasis will be placed on a fundamental understanding of first principles.
- Each student will have an exam committee consisting of the examiners for each subject and the student's Academic Advisor. The Director of the GPC will select the faculty to serve on the committee for each chosen subject.
- Any faculty member assigned as an examiner for a subject common to multiple students will serve on multiple committees.

- The mathematical component of the student's examination must cover, at a minimum, differential and integral calculus, and boundary value and/or initial value differential equations. Additional math content appropriate to the chosen areas of examination will be included. The committee must insure that sufficient and appropriate math content is included.
- Each committee will give an oral exam after the written exams are graded and discussed by the committee. All faculty are invited to this oral exam and may review the written exams prior to and/or after the oral examination.
- The qualifying exam may also include a take home examination that is intended to test the independent thought processes of the student and assess his/her ability to do independent research. The examination, which will be prepared by the committee, may consist of one or more of the following: a critical review of specific literature, problem solving, application of specific scientific principles to the dissertation topic, preparation of a proposal for research, or other creative assignments as may be devised by the committee.
- The committee will then submit a performance report on all aspects of the examinations and a pass/conditional pass/fail recommendation to a faculty member designated by the Director of the GPC. The pass/ conditional pass/fail recommendation will be based upon the majority vote of the entire committee. The recommendations of all committees, and all other pertinent information, will be presented to the MABE faculty at a common time. The faculty will then vote on a pass/ conditional pass/fail for each student.
- If a student fails the exam, the committee may recommend that the student be allowed to retake the exam. If approved by the faculty, the student must retake the exam at its next offering. No additional attempt will be allowed if the student fails the second exam.

A sample registration form for the Ph.D. Qualifying Examination is given in Appendix K. (The subjects shown there are for Fall 2008 and may be changed in subsequent semesters. A new form will be issued for each offering of the exam.) The exam is typically given in the fall semester, with registration required in the preceding spring semester. After registration is complete, the Director of the Graduate Programs Committee will appoint the faculty committee for each exam subject. By the end of the term, each subject committee will issue guidelines for its exam. These will include such things as fundamental topics to be covered, closed book versus open book, relevant UT courses, etc. The level of difficulty of the qualifying examination is consistent with material typically given in undergraduate and introductory graduate courses.

The student's doctoral committee will administer an oral examination after the completion of his/her graduate coursework. The content of this exam will focus on the student's dissertation proposal.

After successfully completing the qualifying examination and oral examination regarding the dissertation proposal, the student will have passed the Ph.D. Comprehensive Examination and can be admitted to candidacy.

### **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 mem-

bership of the committee. The committee must include at least four faculty members, with at least two (one for ES majors) 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 and Oral Comprehensive Examination**

All Ph.D. graduate students must complete original research as a degree requirement. The student must prepare a comprehensive proposal, which 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.

The student's dissertation proposal presentation will take place coincidentally with the oral portion of the comprehensive examination. Passing of this oral examination and approval of the dissertation research proposal by the student's advisory committee 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 department head at UTK, 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 course work 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.

## 7. ADMISSION POLICY

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

### Graduate School

- Bachelor's degree from accredited entity or foreign equivalency.
- Minimum cumulative GPA of 2.70 or 3.00 during senior year for undergraduate study.
- Minimum cumulative GPA of 3.00 for applicants having previous graduate work.
- Minimum TOEFL score of 550 (written exam) or 213 (computer-based exam), applicable only to those students whose native language is not English.

### MABE Department

- 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 using application forms available at <http://gradschool.utk.edu/gradforms.shtml>. **The MABE Graduate Student Application together with three letters of recommendation is also required (<http://www.engr.utk.edu/mabe/pdfs/MABE%20Graduate%20Application.pdf>)**

At UTK, applicants for the M.S. degree in either ME or AE, 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 or AE will presume a broad-based background in the discipline. Therefore, the Director of the Graduate Programs Committee will decide upon a program of ME/AE undergraduate prerequisites appropriate to the student's background at the time of admission. This includes students switching from ME to AE (or vice-versa) for their M.S. programs.

At UTK, applicants for the Ph.D. degree in either ME or AE, 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 inappropriate. The student and his/her advisor will submit a planned program of study for approval to the Director of the Graduate Programs Committee.

At UTK, M.S. and Ph.D. programs with a major in either BME or ES are open to graduates of recognized curricula in engineering, mathematics, or the physical or biological sciences. Students entering either the BME or ES graduate program without an undergraduate engineering degree will likely be required to complete additional engineering course work to meet degree requirements.

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 the Graduate Programs Committee, and must comply with the requirements of the Graduate School.

## 8. FINANCIAL SUPPORT

Many graduate students receive fellowships, research assistantships or teaching assistantships. The opportunities, stipends and application procedures are summarized below. **NOTE:** Except for graduate co-op students, M.S. students receiving financial assistance from the department or faculty must take the thesis option.

### Fellowships

Students with a 3.60 GPA in all previous course work 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 web site, <http://www.engr.utk.edu/mabe>.

### Graduate Research Assistantships

Many MABE graduate students are supported with Graduate Research Assistantships (GRA's), 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 GRA's that correlate with thesis or dissertation activities.

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

### Graduate Assistantships and Graduate Teaching Assistantships

Graduate Assistantships (GA's) and Graduate Teaching Assistantships (GTA's) exist within the MABE department as well as the Engineering Fundamentals Division. Students holding a GA typically work in laboratories or assist faculty teaching undergraduate courses. Work schedules require 10/20 hours per week, for a quarter-time/half-time appointment, respectively. Appointments are twelve months duration and tuition and maintenance fees are waived. A student holding a GTA is directly involved in teaching an undergraduate class. Work schedules and rate of pay are similar to the GA, and tuition and maintenance fees are waived.

The Graduate School limits the duration that a student may hold a GA or 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 GA or 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*.

### **Waiver of Fees**

Graduate assistants, teaching assistants and associates, research assistants, staff, and others whose fees are billed, prepaid, waived, or partially waived confirm their attendance by making payment or signing a Confirmation of Attendance Form by the due date as published in the Timetable of Classes or the schedule will be cancelled. If an appointment terminates during the term, the student owes the appropriate fees from the termination date until the end of the term. Note: Graduate students are not eligible for UT spouse/dependent discounts.

### **9. 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.

### **10. DISMISSAL**

The following statement can be found in the Graduate Catalogue 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 an MABE 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.

\_\_\_\_\_ Ph. D.

program in

\_\_\_\_\_ Mechanical Engineering

\_\_\_\_\_ Aerospace Engineering

\_\_\_\_\_ Biomedical Engineering

\_\_\_\_\_ Engineering Science

at the University of Tennessee at the

\_\_\_\_\_ 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.

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Student Signature Date

---

Director, Graduate Programs Committee Date

---

Department Head 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 any ME/AE/BME/ES graduate program.

\_\_\_\_\_  
Student Signature Date

\_\_\_\_\_  
Academic Advisor (Major Professor) Date

\_\_\_\_\_  
Director, Graduate Programs Committee Date

\_\_\_\_\_  
Department Head Date

### 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.

<b>Date</b>	<b>Step</b>	<b>Action</b>	<b>Notes</b>
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.
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).
	3	Select degree option: thesis/non-thesis.	The student has two options: thesis and non-thesis. The student's advisor will lead the student through the evaluation of potential options.
1st term	4	Develop program of study (Appendix D, E, or F).	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 the GPC.
	5	Select research/problem topic.	The topic selected is based primarily on the student's professional/career interests and goals. The Academic Advisor is normally from the MABE Department, however it is possible for the Academic Advisor to be from another department subject to the approval of the Department Head. Advisor changes must be approved by the GPC.

<b>Date</b>	<b>Step</b>	<b>Action</b>	<b>Notes</b>
	5a	Revise course of study plan if appropriate.	Selection of topical emphasis may necessitate modifying the original plan. The revised <i>Planned Program of Study for M.S.</i> (Appendix D, E or F) 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 <i>Admission to Candidacy Application</i> 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 majors may use no more than one 400-level <i>engineering</i> course to meet minimum course requirements. Transferable credits are determined by the student's advisory committee. 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 two weeks prior to the date of the final examination.

<b>Date</b>	<b>Step</b>	<b>Action</b>	<b>Notes</b>
	10	Make arrangements for, and schedule, final examination.	For the thesis option, 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) 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 <a href="http://gradschool.utk.edu/CurrentStudents.shtml">http://gradschool.utk.edu/CurrentStudents.shtml</a>
	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 AE/ME**

Name: \_\_\_\_\_ Student ID #: \_\_\_\_\_

Advisor: \_\_\_\_\_ Date: \_\_\_\_\_

**Course Plan**

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

Courses in major (12/18 cr. hr. min. req'd for thesis/non-thesis option) \_\_\_\_\_ hours

Explicitly list using table Nos. from 1-12:

Math 4xx or 5xx (6 cr. hr. min. req'd) \_\_\_\_\_ hours

Nos.:

Engineering courses 4xx (max. 3 cr. hr.) \_\_\_\_\_ hours

Nos.:

Total 4xx courses (max. 10 cr. hr.) \_\_\_\_\_ hours

Nos.:

AE or ME 590 ( $0 \leq \text{cr. hr.} \leq 6$ ) \_\_\_\_\_ hours

Seminar (every Fall and Spring) \_\_\_\_\_ hours

Total course work (24/30 cr. hr. min. req'd for thesis/non-thesis option) \_\_\_\_\_ hours

Nos.:

Thesis (6 cr. hr. min. req'd for thesis option) \_\_\_\_\_ hours

\_\_\_\_\_  
Student Signature Date

\_\_\_\_\_  
Academic Advisor (Major Professor)\ Date

\_\_\_\_\_  
Director, Graduate Programs Committee Date

## APPENDIX E. PLANNED PROGRAM OF STUDY, M.S. IN BME

Name: \_\_\_\_\_ Student ID #: \_\_\_\_\_

Advisor: \_\_\_\_\_ Date: \_\_\_\_\_

### Course Plan

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

Courses in major (12/18 cr. hr. min. req'd for thesis/non-thesis option) \_\_\_\_\_ hours

Explicitly list using table Nos. from 1-12:

Math 4xx or 5xx (6 cr. hr. min. req'd) \_\_\_\_\_ hours

Nos.:

Engineering courses 4xx (max. 3 cr. hr.) \_\_\_\_\_ hours

Nos.:

Total 4xx courses (max. 10 cr. hr.) \_\_\_\_\_ hours

Nos.:

BME 590 (0 ≤ cr. hr. ≤ 6) \_\_\_\_\_ hours

Seminar (every Fall and Spring) \_\_\_\_\_ hours

Total course work (24/30 cr. hr. min. req'd for thesis/non-thesis option) \_\_\_\_\_ hours

Nos.:

Thesis (6 cr. hr. min. req'd for thesis option) \_\_\_\_\_ hours

\_\_\_\_\_  
Student Signature Date

\_\_\_\_\_  
Academic Advisor (Major Professor) Date

\_\_\_\_\_  
Director, Graduate Programs Committee Date

## APPENDIX F. PLANNED PROGRAM OF STUDY, M.S. IN ES

Name: \_\_\_\_\_ Student ID #: \_\_\_\_\_

Advisor: \_\_\_\_\_ Date: \_\_\_\_\_

### Course Plan

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

Engineering courses (12/15 cr. hr. min. req'd for thesis/non-thesis option) \_\_\_\_\_ hours

Explicitly list using table Nos. from 1-12:

Math 4xx or 5xx (6 cr. hr. min. req'd) \_\_\_\_\_ hours

Nos.:

Total 4xx courses (max. 10 cr. hr.) \_\_\_\_\_ hours

Nos.:

Related courses (max. 6/9 cr. hr. for thesis/non-thesis option) \_\_\_\_\_ hours

Nos.:

ES 590 (0 ≤ cr. hr. ≤ 6) \_\_\_\_\_ hours

Seminar (every Fall and Spring) \_\_\_\_\_ hours

Total course work (24/30 cr. hr. min. req'd for thesis/non-thesis option) \_\_\_\_\_ hours

Nos.:

Thesis (6 cr. hr. min. req'd for thesis option) \_\_\_\_\_ hours

\_\_\_\_\_  
Student Signature Date

\_\_\_\_\_  
Academic Advisor (Major Professor) Date

\_\_\_\_\_  
Director, Graduate Programs Committee Date

**APPENDIX G. 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**

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Student Signature Date

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Academic Advisor (Major Professor) Date

---

Thesis Committee Member Date

---

Thesis Committee Member Date

---

Thesis Committee Member Date

---

Director, Graduate Programs Committee Date

## APPENDIX H. 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.

<b>Date</b>	<b>Step</b>	<b>Action</b>	<b>Notes</b>
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.
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).
	3	Register for and take departmental qualifying examinations.	The student and his/her Academic Advisor should select appropriate topics. Relevant information is given in Section 7 and Appendix K of this handbook.
1st year	4	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.
	5	Select research topic.	The topic selected is based primarily on the research interests shared by the student and his/her Academic Advisor (Major Professor).
	6	Establish course plan (Appendix I or J).	Select courses with approval of the advisory committee.

<b>Date</b>	<b>Step</b>	<b>Action</b>	<b>Notes</b>
	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 <i>Admission to Candidacy Application</i> 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 <i>Recommended Arrangements for Final Examination</i> 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 <a href="http://gradschool.utk.edu/CurrentStudents.shtml">http://gradschool.utk.edu/CurrentStudents.shtml</a> .
	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 I. PLANNED PROGRAM OF STUDY, PH.D. IN AE, BME OR ME**

Name: \_\_\_\_\_ Student ID #: \_\_\_\_\_

Advisor: \_\_\_\_\_ Date: \_\_\_\_\_

**Course Plan**

No.	Course	Semester	Grade	No.	Course	Semester	Grade
1				13			
2				14			
3				15			
4				16			
5				17			
6				18			
7				19			
8				20			
9				21			
10				22			
11				23			
12				24			

Math 5xx or 6xx (6 cr. hr. min. req'd) \_\_\_\_\_ hours

Explicitly list using table Nos. from 1-24:

Math 4xx or above (12 cr. hr. min req'd) \_\_\_\_\_ hours

Nos.:

Courses in major (12 cr. hr. min. req'd) \_\_\_\_\_ hours

Nos.:

Department courses 6xx (9 cr. hr. min. req'd) \_\_\_\_\_ hours

Nos.:

Department courses (24 cr. hr. min. req'd) \_\_\_\_\_ hours

Nos.:

Total course work (48 cr. hr. min. req'd) \_\_\_\_\_ hours

Nos.:

Dissertation (24 cr. hr. min. req'd) \_\_\_\_\_ hours

\_\_\_\_\_  
Student Signature Date

\_\_\_\_\_  
Academic Advisor (Major Professor) Date

\_\_\_\_\_  
Director, Graduate Programs Committee Date

**APPENDIX J. PLANNED PROGRAM OF STUDY, PH.D. IN ES**

Name: \_\_\_\_\_ Student ID #: \_\_\_\_\_

Advisor: \_\_\_\_\_ Date: \_\_\_\_\_

**Course Plan**

No.	Course	Semester	Grade	No.	Course	Semester	Grade
1				13			
2				14			
3				15			
4				16			
5				17			
6				18			
7				19			
8				20			
9				21			
10				22			
11				23			
12				24			

Math or Computer Science 4xx or above (12 cr. hr. min req'd) \_\_\_\_\_ hours

Explicitly list using table Nos. from 1-24:

Engineering courses 6xx (9 cr. hr. min. req'd) \_\_\_\_\_ hours

Nos.:

Engineering courses 5xx and 6xx (24 cr. hr. min. req'd) \_\_\_\_\_ hours

Nos.:

Total course work (48 cr. hr. min. req'd) \_\_\_\_\_ hours

Nos.:

Dissertation (24 cr. hr. min. req'd) \_\_\_\_\_ hours

\_\_\_\_\_  
Student Signature Date

\_\_\_\_\_  
Academic Advisor (Major Professor) Date

\_\_\_\_\_  
Director, Graduate Programs Committee Date

**APPENDIX K. SAMPLE REGISTRATION FORM FOR PH.D. QUALIFYING EXAMINATION**

To the MABE Graduate Programs Committee (GPC):

I, (PRINT) \_\_\_\_\_ hereby request to take the MABE Ph. D. Qualifying Examination at the beginning of the Fall 2008 semester. I propose to be examined in the **three** subjects marked below.

**[Note: The topics listed below are those offered in Fall 2008. In subsequent semesters, these topics may be changed. Current application forms will be issued annually and will be available on the MABE web site. DO NOT SUBMIT THIS SAMPLE.]**

- |   |   |
|---|---|
| <input type="checkbox"/> Aeropropulsion               | <input type="checkbox"/> Fluid Mechanics                  |
| <input type="checkbox"/> Astronautics                 | <input type="checkbox"/> Heat Transfer                    |
| <input type="checkbox"/> Bioinstrumentation           | <input type="checkbox"/> Mathematics                      |
| <input type="checkbox"/> Biomaterials                 | <input type="checkbox"/> Mechanics of Materials           |
| <input type="checkbox"/> Biomechanics                 | <input type="checkbox"/> Thermodynamics                   |
| <input type="checkbox"/> Computational Fluid Dynamics | <input type="checkbox"/> Vibrations                       |
| <input type="checkbox"/> Controls                     | <input type="checkbox"/> Other: _____                     |
| <input type="checkbox"/> Dynamics                     | (Requires GPC approval.<br>No more than one per student.) |

I understand that after the written examination has been administered, there will be an oral examination on these topics on a date chosen by my examination committee.

---

Student Signature \_\_\_\_\_ Date \_\_\_\_\_

---

Academic Advisor (Major Professor) \_\_\_\_\_ Date \_\_\_\_\_

---

Director, Graduate Programs Committee \_\_\_\_\_ Date \_\_\_\_\_