

GRADUATE STUDENT HANDBOOK
DEPARTMENT OF MECHANICAL ENGINEERING
2010-2011

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TABLE OF CONTENTS

Foreword	5
I. Introduction	6
II. General Procedures	6
1. Admission Requirements (Regular Admission)	6
2. Admission Requirements for the University Scholars Program	7
a. Degree Requirements	7
b. Admission Requirements	7
3. Post-Baccalaureate Status	7
4. Activities for New Students	7
a. Orientations	7
b. Graduate Student Profile	7
c. Assignment of a Faculty Advisor	8
d. Program Planning	8
e. Classification and Registration	8
f. Office Space	8
g. Keys	8
5. Activities for Recurring Students	8
a. Plan of Study	8
b. Application for Degree	8
c. Time Limits for Graduate Degrees	8
6. Leaving the Department	9
7. Courses and Grades	9
a. Regular Semester	9
b. Summer Term	9
c. Incomplete Grades	9
d. Repeat Options	9
e. Scholastic Probation	9
8. Review and Dismissal	9
a. Conditions for Dismissal	9
b. Procedure	10
9. Departmental Seminars	10
a. William Maxwell Reed Seminars	10
b. Safety Training Seminars	10
III. The Master of Science Degree	10
1. Program Options	10
a. Option A (Thesis Plan)	10

b. Option B (Regular Program).....	10
c. Option B (Paducah Program)	10
d. Transfer of Program	11
2. Course Requirements	11
a. Transfer of Credits	11
b. Requirements by Numbering	11
c. Requirements by Major Area	11
d. Grades	12
e. When Formal Coursework is Completed	12
3. Application for Degree	12
4. Thesis Requirements	12
5. Final Examination	12
6. Submission of Thesis	12
IV. The Doctor of Philosophy Degree	12
1. Course Requirements	13
2. Major Professor	13
3. Preliminary Ph.D. Committee	14
4. Advisory Committee	14
5. Pre-Qualifying Examination	14
6. Qualifying Examination	14
7. Ph.D. Mathematics Requirement	15
8. Residence Requirement	15
a. Actual Presence on Campus	15
b. Pre-Qualifying Residency Requirement	15
c. Post-Qualifying Residency Requirement	16
9. Admission to Doctoral Candidacy	16
10. Application for Degree	16
11. Doctoral Final Examination	16
a. Scheduling of Examination	16
b. Procedures for Conducting the Final Examination	17
12. Submission of Dissertation	17
V. Operational Guidelines for Departmental Fellowships	17
1. Harper Industries Achievement Fellowship.....	17
a. Criteria for Eligibility	18
2. Harper Industries Graduate Fellowship	18
a. Criteria for Eligibility	18
b. Nomination Process	18
c. Selection Process	18

d. Due Date for Nominations	18
3. TVA Graduate Fellowship	18
a. Criteria for Eligibility	18
b. Nomination Process	18
VI. Operational Guidelines for Assistantships	18
1. Teaching Assistantships	18
a. Responsibilities	18
b. Period of Appointment	19
c. Stipend and Compensation	19
2. Research Assistantships	19
a. Responsibilities	19
b. Period of Appointment	19
c. Stipend and Compensation	19
3. Renewal and Termination of Appointments	19
4. Holidays, Vacations and Sick Leave	20
Appendix A (Special Requirements for Entry into Mechanical Engineering Programs)	21
Appendix B (Mechanical Engineering Graduate Student Profile)	22
Appendix C (Mechanical Engineering Graduate Program Plan of Study)	
Appendix C1 (M.S. - Option A)	23
Appendix C2 (M.S. - Option B)	24
Appendix C3 (Ph.D. – No Prior M.S.)	25
Appendix C4 (Ph.D. – Prior/Concurrent M.S.)	26
Appendix D (MSME Program Requirements)	
Appendix D1 (Manufacturing Area)	27
Appendix D2 (Mechanics Area)	28
Appendix D3 (Systems and Design Area)	29
Appendix D4 (Thermal-Fluid Sciences Area)	30
Appendix D5 (Non-Thesis—Option B Paducah Program)	31
Appendix E (M.S. Option B – Final Examination Guidelines)	32
Appendix F (Transfer of Program Request)	33
Appendix G (Preliminary Ph.D. Committee)	34
Appendix H (Pre-Qualifying Examination Evaluation)	35
Appendix I (Departmental Procedure for Ph.D. Qualifying Examination)	36
Appendix J (Application for the Written Portion of the Qualifying Examination)	37
Appendix K (Written Portion of the Qualifying Examination)	38
Appendix L (Procedure for the Oral Portion of the Qualifying Examination)	39
Appendix M (Ph.D. Mathematics Requirement)	40
Appendix N (Mechanical Engineering Graduate Student Exit Interview)	41

Departmental forms can be found at:
<http://www.engr.uky.edu/me/graduate/forms.html>

Appendix O (Graduate School Forms)42

- Add/Drop Worksheet
- Request for Credit Overload
- Extension of Incomplete ("I") Grade
- Request for Post Mid-Term Withdrawal
- Request for Repeat Option
- University Scholars Program Application
- Concurrent Master's Degrees Form
- Transfer of Credit Form
- Request for Final Master's Degree Examination
- Thesis Approval Form
- Electronic Master's Thesis Approval Form
- Electronic Doctoral Dissertation Approval Form

Graduate School forms can be found at:
<http://www.research.uky.edu/gs/gforms.html>

FOREWORD

This handbook is intended to be a general guide for graduate students in the Department of Mechanical Engineering. It outlines the rules and procedures of the current M.S. and Ph.D. programs in the department. This information is not intended to be a substitute for the *Graduate Bulletin* which is the authoritative source of information for all graduate students. This guide will be updated every year to respond to the changes that occur during the year. If you have any questions or suggestions, please contact me.

I wish you a successful stay in the graduate program. Enjoy it and work hard.

Dr. L. Scott Stephens
Chair and Engineering Alumni Professor
August 21, 2009

<http://www.engr.uky.edu/me/graduate/>

MECHANICAL ENGINEERING

GRADUATE STUDENT HANDBOOK (2009-2010)

I. INTRODUCTION

The Department of Mechanical Engineering at the University of Kentucky provides an intellectually challenging environment in which to pursue advanced studies and engage in research. The department offers programs of study leading to the M.S. degree in mechanical engineering as well as the Ph.D. degree. Financial assistance is available to qualified applicants in the form of graduate teaching assistantships, research assistantships or fellowships. Stipends vary depending on the student's program level and type of support.

Graduate students work closely with faculty recognized as renowned authorities in their discipline. Many of these research projects are at the forefront of technology. Graduate work may be focused in any of the following areas:

Manufacturing: analytical and numerical modeling, optimization of machining processes and systems, lean manufacturing, sustainable manufacturing, precision manufacturing, and robotics and machine vision.

Mechanics: dynamic analysis of solids, contact mechanics, system identification of structures, thermal stress and boundary element methods.

Systems and Design: application of nontraditional materials, finite elements, acoustics, vibration and noise prediction, mechatronic systems, rotating machinery dynamics, engineered surfaces, magnetic bearing technology, and boundary element methods in acoustics.

Thermal-Fluid Sciences: combustion and fire research, painting technology, nano-technology, computational and experimental fluid dynamics, conduction and convection heat transfer, energy utilization, phase change heat transfer, radiation heat transfer, and optics.

II. GENERAL PROCEDURES

1. Admission Requirements (Regular Admission)

Applicants seeking admission to a graduate program in the Department of Mechanical Engineering (ME) as regular students must have been awarded a baccalaureate degree. Admission to the ME graduate programs normally requires a bachelor's degree in engineering (not necessarily in mechanical engineering), a grade point average (GPA) of 3.0/4.0 or 70% on all graduate and undergraduate works, and Graduate Record Examination (GRE) scores of at least 1200 for the combined Quantitative and Verbal sections and 3.5 for the Analytical section. An undergraduate degree in mathematics, chemistry or physics combined with a strong interest in engineering topics may be suitable preparation when certain required undergraduate courses are taken (see Appendix A for further details). Exceptions to these requirements may be made if other persuasive evidence indicating the student's potential of success is available.

In addition, all international students (except those with a degree from a U.S. institution) must have a minimum score of 550 (paper) / 213 (computer) / 80 (Internet) on the Test of English as a Foreign Language (TOEFL).

It is possible to directly admit a student with a bachelor's degree to the Ph.D. program if the student's qualifications are exceptional. Under some circumstances, such arrangement can be made with a recommendation of a faculty member. Students are encouraged to contact the departmental faculty if they are interested in going into the Ph.D. program without a Master's degree.

Regular admission to the Master's program constitutes admission to candidacy for that degree. Admission to candidacy for the Ph.D. degree is automatically granted when

the student passes the Qualifying Examination (page 14).

2. Admission Requirements for the University Scholars Program (combined Master's / Bachelor's Degree program)

The University Scholars Program offers highly motivated undergraduates the opportunity and the challenge of integrating their undergraduate and graduate courses in a single continuous program culminating in both a baccalaureate and master's degree.

a. Degree Requirements

(1) Twelve (12) hours of graduate work will count for both graduate and undergraduate programs. The requirements for the bachelor's degree are unchanged.

(2) Students may take no more than 16 credit hours per semester except by recommendation of the Director of Graduate Studies (DGS) and approval of the Dean of the Graduate School.

(3) Students must have an undergraduate advisor and a graduate advisor. A jointly planned program must be prepared for each student.

b. Admission Requirements

(1) Application to the program should be submitted to the DGS at the end of the student's junior year.

(2) Applicants must have completed at least 90 credit hours of work toward the bachelor's degree, or be eligible for senior standing in the semester they are admitted to the program.

(3) The undergraduate grade point average must be at least 3.5 in mechanical engineering and 3.2 overall.

(4) Admission decisions will be made by the Dean of the Graduate School or his/her appointee.

3. Post-Baccalaureate Status

Students who hold a baccalaureate degree from a fully accredited institution of higher learning and who wish to pursue graduate study without a degree objective as well as

students who do not fulfill the entrance requirements of the Graduate School may apply for admission as post-baccalaureate graduate students. However, post-baccalaureate status is not available for non-Kentucky residents or International applicants.

Students in the post-baccalaureate status may take courses for graduate credit but may not apply more than nine (9) credit hours with a grade of A or B earned in the post-baccalaureate status to any degree program leading to a graduate degree at the University of Kentucky (UK). All transfers of credit hours to the ME graduate program – whether from other institutions or from other UK graduate programs, including credit earned while in post-baccalaureate status – must be approved by the DGS and the Dean of the Graduate School.

Post-baccalaureate status is not a form of probationary admission to a degree-granting graduate program. Post-baccalaureate students who wish to apply for an ME graduate program must satisfy the standard admission requirements for the Department of Mechanical Engineering.

4. Activities for New Students

a. Orientations

All new students are encouraged to attend the orientation organized by the Graduate School. There will be a separate departmental orientation in the beginning of the Fall semester and all students are required to attend.

b. Graduate Student Profile

The Director of Graduates Studies maintains a personal profile of all mechanical engineering graduate students. A *Graduate Student Profile* (see Appendix B) should be submitted to the DGS at the beginning of the graduate program in order to ensure that the department has current contact information of each student. An e-mail listserv is frequently used for rapid communications with students. All graduate students are subscribed to this mailing list and check their e-mail at least twice a week if not daily. It is the responsibility of each student to obtain an engineering e-mail account from Engineering Computing

Services (257-3518) and report his/her e-mail address to the DGS at *ME-DGS@engr.uky.edu* as soon as possible. You may have this email address forwarded to your personal email if you wish.

Should there be any changes to the student's profile, he/she needs to report to the DGS by updating the *Graduate Student Profile* sheet immediately.

c. Assignment of a Faculty Advisor

The Director of Graduate Studies serves as the advisor to new graduate students until they identify a permanent advisor. The Option A or Ph.D. student is encouraged to discuss with the faculty of his/her interest and select an advisor in the first four weeks of the semester. Should you not be able to find an advisor, you should report to the DGS and he will act as a temporary advisor for the remainder of the semester. The DGS will act as an advisor for all Option B students.

d. Program Planning

The student should consult with the Director of Graduate Studies and his/her thesis advisor to discuss the *Plan of Study* (Appendices C1-C4). The primary purpose of this effort is to help define the educational objectives of the student and to ensure that the student is fully aware of the university and the departmental degree requirements. Such planning at this stage is rather informal and subject to future modifications. However, if there are any modifications to be made to this plan of study, a new form should be approved and submitted to the DGS.

e. Classification and Registration

New and readmitted students register during the week prior to the start of classes. See the University's *Schedule of Classes* for dates for each semester. New students are informed of the dates at the time of acceptance. Students who were enrolled in the previous semester may not register at this time. Continuing students who failed to priority register as well as new and readmitted students who applied after the deadline must late register during the first week of classes.

f. Office Space

Office space is available on a limited basis to option A M.S. and Ph.D. graduate students. Contact your thesis advisor or the Director of Graduate Studies regarding available spaces. Priority will be given to those engaged in research activities.

g. Keys

Graduate students frequently require keys for access to University offices, laboratories and buildings. Requests for keys are initiated by completing a *Key Request* form available in the Department Office. The Chairman and advisor must certify the validity of each key request.

5. Activities for Recurring Students

a. Plan of Study

Each student, in consultation with a faculty advisor, should prepare and obtain approval for a *Plan of Study* (Appendices C1-C4) before registration each semester. This is to ensure that you are on track for your degree.

b. Application for Degree

To be eligible for a degree, the student must file an application at the Graduate School within 30 days after the beginning of the semester in which he/she expects to graduate, or within 15 days after the beginning of the summer session. The student must obtain the application forms from the Graduate School.

c. Time Limits for Graduate Degrees

Master's Candidates: Activities which are used to satisfy master's degree requirements must be completed within 8 years preceding the proposed date of graduation. Extensions of time will be considered by the Dean of the Graduate School and the Graduate Council only upon written recommendation by the appropriate Director of Graduate Studies. Extensions up to 10 years (total) may be approved directly by the Dean of the Graduate School. Extensions up to 12 years must be approved by the Graduate Council. No activity completed more than 12 calendar years preceding the proposed graduation date will be considered for graduation.

Doctoral Candidates: All degree requirements for the doctorate must be completed within five years following the semester or summer session in which the candidate successfully completes the qualifying examination. In the event that all degree requirements are not met during the five (5)-year period, degree candidates who provide evidence of the likelihood of completing the degree during an extension of time may be granted such an extension by the Graduate Council upon re-taking the qualifying examination. Requests will be considered only upon written recommendation of the Director of Graduate Studies.

6. Leaving the Department

All students must conduct an exit interview before leaving the department (this includes leaving the department prior to finishing the program as well as graduation). The *Graduate Student Exit Interview* form (Appendix N) must be signed by the thesis advisor and the Director of Graduate Studies before departure. In addition to returning the key(s) for the office and building, cleaning up office/lab spaces, returning books/solution manuals and filing a UK employee separation form, the department will keep a profile of all alumni to maintain close contact.

7. Courses and Grades

a. Regular Semester

A full-time graduate student is one who is enrolled in nine (9) or more semester hours of coursework. Graduate students are expected to remain in full-time status until their course and/or residence requirements are met.

b. Summer Term

Students are expected to conduct full-time research during the summer period. Therefore, in general, no regularly scheduled mechanical engineering graduate courses are offered during this period.

c. Incomplete Grades

All incomplete grades must be removed from the student's record before scheduling the final examination and the awarding of a degree. Removal may be accomplished in two ways:

(1) Complete the requirements for the course and receive a letter grade.

(2) Provide the Dean of the Graduate School with letters from the student's advisor or special committee Chair and the Director of Graduate Studies stating that the incomplete course is no longer part of the student's program.

An incomplete grade "I" will automatically be changed to a failing grade "E" if not removed within a year from the date the grade was assigned.

d. Repeat Options

A student may repeat a graduate course and count only the second grade as part of the graduate grade point average. This action will be initiated by petition (*Repeat Option* form, available at the Graduate School website) of the Director of Graduate Studies to the Dean of Graduate Studies and may be done only once in a particular degree program.

e. Scholastic Probation

When students have completed 12 or more semester hours of graduate coursework with a GPA of less than 3.0, they will be placed on scholastic probation. Students will have one full-term semester or the equivalent (9 hours) to remove the scholastic probation by attaining a 3.0 (overall) average. If the probation is not removed, the student will be subject to dismissal from the Graduate School.

8. Review and Dismissal

The progress of each graduate student will be reviewed by the Director of Graduate Studies, in consultation with the Graduate Studies Committee and the student's academic advisor once each semester. If a student's progress is unsatisfactory, that student will be dismissed from the ME graduate program.

a. Conditions for Dismissal

(1) Any regular student who has completed 12 or more hours of graduate coursework and who has not attained at least a 3.0 GPA may be subject to probationary status and dismissed from the program.

(2) Any student who has completed the formal coursework and/or residence requirements and is not making satisfactory progress toward the completion of the remaining degree requirements may be dismissed from the program.

b. Procedure

(1) The dismissal is effective at the end of the semester in which the review is made.

(2) The student will be notified in writing of the potential dismissal within four weeks of the beginning of the semester in which the review is made.

(3) If the student is in the Ph.D. program, the student's Advisory Committee shall be consulted by the Director of Graduate Studies before the dismissal decision is made.

9. Departmental Seminars

a. William Maxwell Reed Seminars

To supplement the student's formal coursework and research experience, the Department of Mechanical Engineering, in conjunction with the Graduate School, offers the William Maxwell Reed Seminar Series.

All students must attend the William Maxwell Reed seminars. There will be approximately 6-8 seminars each semester. These seminars will be held on Thursdays from 3:30 to 4:30 p.m. The specific dates for each semester will be provided on a separate announcement. Attendance will be taken at each seminar.

Continued funding of Teaching Assistants will be partially-based on attendance of the William Maxwell Reed seminars. Other factors, such as performance and availability of funding, will also be used.

The attendance record of all Research Assistants will be reported by the DGS to the faculty advisor. Attendance of the seminars will also be used as a factor when evaluating students (including RAs) for fellowships and scholarships.

If you have a conflict (for instance, if one of your classes conflicts with the seminar), you

must notify Jill Fisher immediately via email to obtain prior approval for your absence.

b. Safety Training Seminars

All graduate students are required to attend some safety training seminars as provided by the safety committee of the Department of Mechanical Engineering.

III. THE MASTER OF SCIENCE DEGREE (M.S.)

1. Program Options

There are two options for fulfilling the requirements for the M.S. degree, Option A and Option B. Students are admitted directly into the Option A program. Part-time students with outside work may seek approval from the DGS to be admitted to the Option B program.

a. Option A (Thesis Plan)

A minimum of 24 semester hours of coursework and a thesis are required. The thesis must be actively supervised by a full or associate member of the Graduate Faculty. In no case will independent work, taken as ME 780, be counted as part of the 24 hours of coursework when the course material is related to the student's thesis. No more than two (one is typical, two is very rare) special courses such as ME 599 or 699, or independent work such as ME 780 may be counted towards fulfilling requirements for the Master's degree.

In case of an independent course project, the instructor must provide the DGS with a course syllabus in order to obtain approval for the course.

b. Option B (Regular Program)

A minimum of 30 semester hours of coursework is required for this program. Upon entering the Option B program, students are encouraged to transfer to the Ph.D. program if a research-oriented career is desired.

c. Option B (Paducah Program)

This Option B program is designed for students at the Paducah campus. The admission requirements are the same as the regular Option B program. However, the course requirements are modified to make it

more flexible for students to take ITV classes from Lexington to the Paducah campus.

d. Transfer of Program

During the course of the M.S. program (either option A or B), a student may decide to transfer to a Ph.D. program upon recommendation of a faculty member. To initiate any transfer from the M.S. program to the Ph.D. program, a student must complete a *Transfer of Program Request* (Appendix F), and must reapply to the Graduate School. Students may not transfer from the Option A Master's program or a Ph.D. program to the Option B Master's program. Students who wish to transfer from the Ph.D. program to the M.S. Option A program may submit a written request within the first year of the program. Such requests will be granted only with the approval of the student's advisor, the DGS, and a majority of the Graduate Studies Committee.

2. Course Requirements

a. Transfer of Credits

In some cases, a student may transfer a total of nine (9) hours or 25% of regular course degree requirements may be transferred for a master's degree. These hours include all post-baccalaureate work, graduate work taken at another accredited university, or as a student in another graduate program at UK.

(1) Transfer of credit is not accepted at the doctoral level.

(2) Transfer of credit from independent work, research, workshops, practica or thesis work is not permitted.

(3) Transfer credit is accepted only from regionally-accredited institutions.

(4) Short courses lasting fewer weeks than the number of credits may not be transferred.

(5) A student must have been in graduate status at the time the courses were taken in order for the courses to be transferable.

b. Requirements by Numbering

No courses offered by the Department of Mechanical Engineering that are numbered below 500 may be credited toward the MSME degree. A candidate for the M.S. degree may credit toward degree requirements the following:

(1) Any 500-, 600-, or 700-level course; and

(2) Any 400G-level course offered by a department other than Mechanical Engineering.

In addition, the following conditions apply:

(1) A minimum of 12 hours (15 for Option B) of regular 600- and 700-level courses (those meeting as organized classes) and a maximum of six (6) hours of irregular 600- and 700-level courses (such as ME 699 and ME 780).

(2) Two (2) mathematics courses (selection approved by the Director of Graduate Studies, see Appendices D1-D4).

c. Requirements by Major Area

At least one-half of the coursework must be in Mechanical Engineering or, with the approval of the Director of Graduate Studies, in another department offering courses in the student's major area. All courses must be included in the student's *Plan of Study*.

In general, there are four major areas in the Mechanical Engineering program: Manufacturing, Mechanics, Systems and Design and Thermal-Fluid Sciences. Students in each major area must select their courses according to the guidelines in Appendices D1-D4. However, to meet special program requirements of some students, courses in the MSME program requirements as listed in Appendices D1-D4 may be interchanged or substituted with alternative courses. Any such request must be initiated by the student in consultation with the student's faculty advisor and approved by the Director of Graduate Studies.

Students registered under the Option B program from the Paducah campus can

select their courses according to the guidelines set in Appendix D5.

d. Grades

The M.S. degree will be awarded only if the student has attained a grade point average of at least 3.0 on all work taken as a graduate student and on all work carrying graduate credits.

e. When Formal Coursework is Completed

Registration in ME 748 is limited to Option A master's students who have completed all course requirements. Registration in 748 guarantees that a student is considered full-time for the purposes of student financial aid and loan deferments. The DGS must certify that the student is working at least ½ time (i.e. 20 hours per week) on the thesis. Registration in 748 is limited to a maximum of six (6) semesters (not counting summer terms). All 748 registrations are processed in the Graduate School through the recommendation of the DGS.

3. Application for Degree

To be eligible for a degree, students must file an application in the Graduate School within 30 days after the start of the semester (or 15 days into the Eight-Week summer session, in which they expect to complete their work; see the *University Calendar* or *Graduate Bulletin*. This is accomplished by electronically submitting this form via your myUK account.

4. Thesis Requirements (Option A students)

The thesis must be developed under the direction of a full or an associate member of the Graduate Faculty. It must be approved by the thesis director, the Director of Graduate Studies, the Examination Committee and the Graduate School, and must be in conformity with instructions prepared by the Graduate School entitled, *Instructions for the Preparation of Theses and Dissertations*. (Copies of this document are available from the Graduate School.)

5. Final Examination

Both Option A and Option B students must submit the *Final Exam Recommendation Form* which is obtainable from the Graduate School website. The Examination

Committee must consist of three (3) graduate faculty or associate faculty members. This form must be submitted to the Graduate School at least two (2) weeks prior to the exam date.

Master's students will be eligible to sit for the Final Examination only if they have completed all coursework requirements for the degree, or if the remaining coursework is in progress at the time of the examination. Students with "I" grades or "S" grades in credit-bearing courses are not eligible to sit for the final examination. The overall graduate GPA of the student must be 3.0 or better to sit for the examination.

Option A students must submit a thesis in partial fulfillment of the degree program. The Final Exam for the Option A student will be conducted based on the thesis presented to the exam committee. Option B students do not require a thesis, however, their final exam will be based on their general knowledge of the mechanical engineering field. The format of this final examination should generally follow the guidelines found in Appendix E and must be approved by the examination committee.

The final exam must be conducted no later than eight (8) days before the last day of classes for the degree to be awarded at the end of that term (see the *University Calendar* or the *Graduate Bulletin* for exact dates).

6. Submission of Thesis (Option A students)

After the final examination is passed, the final copy of the thesis with the appropriate signatures is submitted. The Graduate School requires two copies unbound and on 100% cotton paper. The cost of preparation and duplication of the thesis is normally borne by the student. The submission of the thesis in its final form must be done 15 days prior to the end of the semester in which the degree is expected.

IV. THE DOCTOR OF PHILOSOPHY DEGREE (PH.D.)

Successful completion of the M.S. program does not guarantee automatic admission to the Ph.D. program. Students who wish to continue for the Ph.D. degree must make

application by letter to the Director of Graduate Studies and to the Graduate School by no later than the fourth week of the semester in which the M.S. degree is awarded.

1. Course Requirements

To obtain a Ph.D. degree from the Department of Mechanical Engineering, a student must:

(a) Earn 48 graduate credit-hours taken at the University of Kentucky while in graduate standing after receiving a bachelor's degree. Alternatively, those with a M.S. may satisfy this requirement by earning 24 graduate credit-hours taken at UK. Students with a M.S. from another institute are required to obtain a letter from the DGS recommending the transfer of credit.

1. Residency and research courses may not be used to satisfy this requirement.
2. No more than nine (9) hours (including those taken for MS) may be in "Topics" courses (e.g. ME 599, ME 699) in mechanical engineering.
3. No more than six (6) hours (including those taken for MS) may be in "Project" courses (e.g. ME 780) in mechanical engineering.
4. At least half of the required hours must be in mechanical engineering.
5. At least half of the required hours must be at the 600 level.
6. No more than nine (9) credit hours of the above requirement may be waived based on courses taken at other institutions. The decision on this waiver will be made by the DGS upon recommendation of the student's Advisory Committee. These non-UK courses are subject to all of the above conditions.

(b) Satisfy the Ph.D. mathematics requirement. (see Appendix M for details)

(c) Pass the Pre-Qualifying Examination after the first semester of the Ph.D. program.

(d) Pass the Ph.D. Written Qualifying Exam. The Preliminary Exam is a written exam and constitutes the written portion of the Qualifying Exam allowed by the Graduate School. This exam tests the student's knowledge in the field of mechanical engineering. This is a uniform exam that is required in three areas (Appendix K). These area exams are given by the corresponding departmental-wide Technical Area Committees. The Ph.D. Preliminary Exam must be taken during or before the student's third Fall Semester (fourth, if admitted without a M.S. from the time of admission to the Ph.D. program. For part time students, this time requirement may be modified with the approval of the student's advisor and the DGS). Failure to attempt the Preliminary Exam within the specified time limit will result in the student's termination from the ME doctoral program.

(e) Pass the Ph.D. Oral Qualifying Exam. This exam inspects the soundness of the student's proposed doctoral dissertation research. A prospectus prepared by the student and submitted to the student's Advisory Committee is required two (2) weeks in advance of the exam. Only those who have passed the Preliminary Exam and have satisfied the Ph.D. mathematics requirement may sit for this exam. As this is an exam mandated by the Graduate School, all Graduate School regulations regarding this exam must be met.

(f) Pass the Final Examination. This exam is mandated by the Graduate School, and therefore all Graduate School regulations regarding this exam must be met.

(g) Meet all applicable Graduate School regulations.

2. Major Professor

Each student's program is guided by a major professor and an advisory committee throughout the student's graduate career. Their purpose is to give continuity of

direction and counsel and to provide intellectual stimulation from the earliest days of residency through the completion of the doctorate.

The Director of Graduate Studies serves as advisor to beginning graduate students. The Director of Graduate Studies performs most advisory functions until the Advisory Committee is appointed, normally not later than the point at which 18 credit hours of graduate work have been accumulated and in any event at least one year prior to the Qualifying Examinations. The Major Professor then assumes primary advisory functions and chairs the Advisory Committee. The Advisory Committee also provides advice to the student and sets specific requirements (within applicable program, Graduate School and University regulations) which the student must meet in pursuit of the doctorate. The Major Professor and Advisory Committee are appointed by the Dean of the Graduate School with the Director of Graduate Studies.

3. Preliminary Ph.D. Committee

During the first semester of the Ph.D. program, the student must contact the thesis advisor to form a preliminary Ph.D. committee. The form for this preliminary committee (Appendix G) must be submitted to the DGS in the first three months of the program. The committee at this stage may be different from the final committee submitted to the Graduate School [Advisory Committee]. The function of this committee is mainly to perform the pre-qualifying examination to assess the Ph.D. student's qualifications in order to continue in the program at the end of the first semester.

4. Advisory Committee

The Advisory Committee has a core of at least four (4) members. This core consists of the Major Professor as Chair, and two other members from the major area. At least one representative must be from outside the academic department. All members of the core must be members of the Graduate Faculty of the University of Kentucky and three (including the Major Professor) must possess full Graduate Faculty status (see DGS or staff assistant for Graduate Faculty status). Additional faculty members may serve as members of the Advisory

Committee. The core of the Advisory Committee must be kept at its full complement throughout the graduate career of the student. Thus, in the event of a vacancy on the Advisory Committee (occasioned by resignation, faculty leave or inability to serve), an appropriate replacement must be made prior to the making of any committee decision.

All decisions of the Advisory Committee are by majority vote of its Graduate Faculty members. Advisory Committee decisions must be reported promptly to the Director of Graduate Studies who will be responsible for transmitting them to the Dean of the Graduate School.

In addition to advising and program planning, the Advisory Committee is also involved with the administration of the oral part of the Qualifying Examination, the supervision of the preparation of the dissertation, and the administration of the Final Examination on the dissertation.

5. Pre-Qualifying Examination

All Ph.D. students must pass the Pre-Qualifying Exam during the second semester of the program. This exam will be administered by the Advisory Committee or the preliminary Ph.D. committee (Evaluation form—Appendix H). This exam can either be in written or oral format depending on the preference of the committee. This committee will advise the DGS via Appendix H whether the student should continue his/her Ph.D. studies after completion of the exam. Students who fail the exam may either choose to withdraw from the program or may submit a written request to transfer to the Option A Master's program. Such requests will be granted only with the approval of the student's advisor, the DGS, and a majority of the Graduate Studies Committee.

6. Qualifying Examination

After passing the Pre-Qualifying Exam and having satisfied the residency requirement, the student is required to take a Qualifying Examination, as mandated by the Graduate School. The purpose of this exam is to determine whether he/she should be admitted to candidacy. There are two components to the Qualifying Examination,

written and oral. The procedure for the entire exam is given in Appendix I.

The written part of the Qualifying Exam is only administered once a year, in the first six weeks of the fall semester. The DGS will invite qualified students to submit their application (Appendix J) to take the exam during the summer. The details of the written portion of the Ph.D. Qualifying Exam are included in Appendix K.

The oral portion of the Qualifying Examination is described in Appendix L. This exam is prepared by the student's Advisory Committee and can only be conducted after the written portion of the exam has been passed and all other requirements for the degree have been completed (except the final exam and the dissertation). Students with "I" grade or "S" grade in credit bearing courses will not be able to sit for the Qualifying Exam until letter grades are assigned for these courses. The oral portion of the Qualifying Examination must be scheduled through the Director of Graduate Studies and approved two weeks in advance by the Graduate School.

The Qualifying Examination card will be sent to the DGS prior to the date of the examination. No exam should commence without a card. All members of the Doctoral Advisory committee must be present at the oral qualifying examination. The results of the examination must be reported by the DGS to the Graduate School within 10 days of its conclusion. If the result is failure, the Advisory Committee determines the conditions to be met before another examination may be given. The minimum time between examinations is four (4) months. A second examination must be taken within one (1) year after taking the first examination. A third examination is not permitted.

7. Ph.D. Mathematics Requirement

In addition to the course requirements detailed in Appendix K, Ph.D. students are also expected to fulfill the ME Department's Ph.D. math requirement. This requirement is also explained in Appendix M. Students are advised to seek the approval of their advisor and the Director of Graduate Studies as

soon as they have decided on the courses that will satisfy the Ph.D.

8. Residence Requirement

a. Actual Presence on Campus

While it is expected that a well-prepared student of good ability may complete the requirements for the doctorate in three years of full-time residence, more than three years may be necessary. Students must complete the equivalent of two (2) years of residency prior to the qualifying examination and one (1) year of the post-qualifying residency. Specifics of this requirement are detailed below.

b. Pre-Qualifying Residency Requirement

1. Doctoral students must satisfy one (1) year of full-time residency in the following three models:

Model I: Complete two (2) consecutive semesters enrolled for nine (9) or more graduate credits per semester.

Model II: Complete three (3) consecutive semesters enrolled for six (6) or more graduate credits per semester.

Model III: Accumulate 24 graduate credits at UK, exclusive of short courses, taken within three (3) consecutive academic or calendar years. (No more than nine (9) of the 24 credits may be earned in summer sessions.)

Students who hold an awarded master's degree from the University of Kentucky in the same discipline and have completed the full-time residency requirements while pursuing the master's degree may apply those semesters to satisfy the above.

2. In addition, students must complete a second year of residency in one or in combination of the following:

(a) Transfer residence credit from an awarded master's degree from another accredited institution (requires letter from the DGS).

- (b) Complete a minimum of 18 hours of work in doctoral status at UK beyond the full-time residency requirement.
- (c) Apply hours completed while pursuing a UK master's degree.

c. Post-Qualifying Residency Requirement

Under the previous post-qualifying residency policy, students were required to register for two consecutive full-time (9 hours) or three consecutive part-time (6 hours or more) semesters of ME 769 before they could graduate. The semester of the qualifying examination counted toward this requirement if the examination was taken within the first six (6) weeks. If more time was needed to complete the dissertation, students then registered in 749 for zero credit hours each fall and spring semester until graduation.

Under the new post-qualifying residency policy, students are required to remain continuously enrolled in a new two (2) credit hour course, ME 767 every fall and spring semester until they have completed and defended the dissertation. As with 769, two semesters of 767 must be completed to be eligible to graduate. In contrast to 769, residency credit will be applied for a qualifying examination taken at any time during the first semester of enrollment in this course. However, the request to schedule the examination must be submitted and approved within the first 6 weeks of the semester. Two hours of 767 constitutes full-time enrollment. All students pay the in-state tuition rate plus mandatory fees for these two credit hours. Non-resident students will receive a scholarship to cover the out-of-state portion of their bill. Students will be responsible for tuition and fees (including applicable out-of-state charges) resulting from enrollment in any additional coursework beyond the two (2) hours of 767.

This new 767 post-qualifying residency policy applies to all students first enrolled in a doctoral program in the fall of 2005. According to University rules, any student who was first enrolled in a doctoral program before the beginning of the Fall 2005 semester, but who has not yet taken the

qualifying examination, may opt to follow either the old (769) or new post-qualifying residency policy. Doctoral students who opt for the old 769 policy must have maintained continuous enrollment in their program. Students who are readmitted to a program will be subject to the new 767 policy, if they have not yet taken the qualifying examination.

9. Admission to Doctoral Candidacy

Students are admitted to candidacy after they have successfully completed the Qualifying Examination. The Registrar is notified by the Graduate School and the date is noted on the transcript.

10. Application for Degree

To be eligible for a degree, students must file an application in the Graduate School within 30 days after the start of the semester (or 15 days into the Eight-Week summer session, in which they expect to complete their work; see the *University Calendar* or *Graduate Bulletin*. This is accomplished by electronically submitting this form via your myUK account.

11. Doctoral Final Examination

a. Scheduling of Examination

In order to initiate the doctoral final examination process, students must electronically submit a Notification of Intent to Schedule a Final Doctoral Examination (see Appendix O) at least eight (8) weeks before the exam is to be scheduled. Upon submission of the form, the Dean of the Graduate School appoints an Outside Examiner.

Following the appointment of the Outside Examiner, the final examination date may be set. The *Request for Final Exam Recommendation* must be submitted electronically to the Graduate School at least two (2) weeks before the scheduled date for the final exam. The Graduate School will send announcements of the examination to each committee member and to the student. Please note that the Doctoral Final Examinations may only be scheduled when classes are in sessions (Fall and Spring semesters, Four-Week and Eight-Week summer sessions). Examination deadlines

and their relation to degree conferral can be found in the *University Calendar*.

Please note that a student will not be allowed to sit for the Final Examination until any remaining "I" or "S" grades in credit-bearing courses have been assigned letter grades.

b. Procedures for Conducting the Final Examination

1. At the outset of the Examination, the DGS or Committee Chair should verify that the Final Examination card has been brought to the examination room. If it has not, it needs to be secured. If the program has not received the card from the Graduate School, the Committee Chair or Director of Graduate Studies must call the Associate Dean's office at the Graduate School to determine if the examination may proceed.

2. The Final Examination may not begin until all (voting) members of the Committee are present. Voting members of the Committee have their names typed on the Examination card; names of non-voting members do not appear on the card.

3. A Final Examination may be cancelled *prior* to its official start for substantive reasons with no permanent consequences for the student. The student has not failed the examination in this case because it had never officially begun. Substantive reasons can include a missing Committee member, a sudden difficulty in the Candidate's personal life that may affect performance, or a (late) opinion on the part of one or more committee members that the dissertation is not ready to defend. In such cases, the Committee may hold an open or closed discussion to review the issues at hand and reach a decision on whether to hold the Examination or not. Furthermore, the Candidate does have the right to cancel the Examination *prior* to its start. If the Examination is cancelled, it must be formally re-scheduled with the Graduate School in the standard fashion. A minimum two (2) - week interval is required for re-scheduling the Examination.

4. Once the Examination has begun, all Committee members must remain present for the duration of the process. In cases in

which Committee members are in contact via electronic means such as a pre-approved conference telephone or interactive video (ITV), if connection is lost, then the examination process should be immediately suspended and not re-started until connection is again fully established.

5. Once the Examination has begun, it must be carried through until its end. A formal vote must be taken and recorded on the Examination card, along with the signatures of all (voting) members. There are only two outcomes possible: by majority vote, a Pass or a Fail. The Examination may not be suspended for an extended period to permit the Candidate to correct deficiencies, and subsequently re-convened. The only suspensions permitted are short ones to permit the Candidate or Committee to refresh themselves.

6. If an emergency situation should arise during the course of an Examination, the Committee chair or DGS should immediately call the Graduate School to seek guidance.

12. Submission of Dissertation

After the Final Examination is passed, the final copy of the dissertation is prepared. Two (2) unbound 100% cotton copies are then submitted to the Graduate School along with the signatures of the advisor and the Director of Graduate Studies. Please consult the *Instructions for the Preparation of Theses and Dissertations* for guidance (copies of this document are available from the Graduate School.) The dissertation in its final form must be received in the Graduate School office within 60 days of the Final Examination. If this deadline is not met, the candidate must undergo another examination. If the student plans to graduate the semester in which the Final Examination is taken, the dissertation must be presented and accepted by the Graduate School by the last day of that semester.

V. OPERATIONAL GUIDELINES FOR DEPARTMENTAL FELLOWSHIPS

1. Harper Industries Achievement Fellowship

Harper Industries Achievement Fellowships are available to offset most of the first-year tuition for new University Scholars in the ME

graduate program. The award is \$1,500 for one year.

a. Criteria for Eligibility

Eligible students are those applying to the University Scholars Program in the Department of Mechanical Engineering at the University of Kentucky. Candidates must have an undergraduate grade point average of 3.5 or higher.

2. Harper Industries Graduate Fellowship

One fellowship is available for an outstanding graduate student applying to the UK ME graduate program (Ph.D. or thesis-option Masters). The award is \$18,000 for one year (12 months). If the student desires a teaching experience, that is allowable under this fellowship.

a. Criteria for Eligibility

Eligible students are new students applying to the graduate program in the Department of Mechanical Engineering at the University of Kentucky. Candidates must have an undergraduate grade point average of 3.5 or higher. Likewise, candidates must have a grade point average of 3.5 or higher for any graduate work.

b. Nomination Process

Candidates for the Harper Industries Graduate Fellowship are self-nominated. Nominees should submit a letter of self-nomination to the Director of Graduate Studies by March 1st elaborating on special qualifications (previous scholarships, honors and awards, research papers, publications, etc.). In order to be considered for this fellowship, all application materials for our graduate program, including resume, statement of purpose and letters of recommendation, must be submitted by this date.

c. Selection Process

The recipient of the fellowship will be determined by the Graduate Studies Committee after reviewing the nomination packages.

d. Due Date for Nominations

The due date for all self-nominations to be submitted to the Director of Graduate

Studies is March 1st. A decision will be made by March 15th.

3. TVA Graduate Fellowship

One fellowship is available for an outstanding graduate student applying to the UK ME graduate program (Ph.D. or thesis-option Masters). The award is \$18,000 for one year (12 months). The recipient of the fellowship shall engage in power engineering research related to TVA's interests with a major professor who is a full-time member of the Department of Mechanical Engineering and the TVA Professor. If the student desires teaching experience, that is allowable under this fellowship. The recipient is required to attend a bi-annual TVA/UK meeting and report the status of his/her research.

a. Criteria for Eligibility

Eligible students are domestic students applying to the graduate program in the Department of Mechanical Engineering at the University of Kentucky. Candidates must have an undergraduate grade point average of 3.5 or higher. Likewise, candidates must have a grade point average of 3.5 or higher for any graduate work.

b. Nomination Process

If you are interested in applying for this fellowship, please contact Dr. Kozo Saito, TVA Professor or the Director of Graduate Studies.

VI. OPERATIONAL GUIDELINES FOR ASSISTANTSHIPS

It is the departmental policy to give preference to Ph.D. students when teaching assistantships and research assistantships are assigned.

1. Teaching Assistantships (TA)

a. Responsibilities

Teaching Assistants are responsible for help in teaching provided to professors in charge of mechanical engineering courses. This may include but is not limited to:

- (1) holding office hours;
- (2) correcting and grading homework;
- (3) conducting recitation hours; and

(4) helping with laboratory experiments.

b. Period of Appointment

The appointment for TA will be made on a semester basis. The continuation of the appointment will hinge upon the satisfactory performance in teaching responsibilities as well as academic achievement which include coursework and research. Evaluation will be performed each semester to form the basis for the continuation of the assistantship support.

All international students must pass the Language Screening Exam administered by the Teaching and Learning Center in order to be eligible for a TA appointment.

(1) The appointment period for Graduate Teaching Assistants is typically for one semester, and renewals are considered by the DGS each semester based on availability and performance.

(2) Appointments may also be made for 4.5 months beginning August 16th and ending December 31st for the fall semester or beginning January 1st and ending May 15th for the spring semester.

(3) Appointments are not normally made for the summer months.

c. Stipend and Compensation

The stipend for Master's program Teaching Assistants is \$625 biweekly. The stipend for Ph.D. program Teaching Assistants is \$675 biweekly. These rates are based on a full teaching assistantship which requires 20 hours per week to be devoted to teaching-related services. Part-time TAs devote 10 hours per week and are paid \$312.50 and \$337.50 for M.S. and Ph.D. students, respectively.

2. Research Assistantships (RA)

a. Responsibilities

Research Assistants are responsible for conducting research under the supervision of their faculty advisor. This may include but is not limited to:

(1) conducting experiments;

(2) design and fabrication of experimental set-ups;

(3) physical/numerical and phenomenological modeling of engineering processes; and

(3) writing of proposals, progress reports and journal publications.

b. Period of Appointment

In general, the period of appointment for a research assistant is one (1) year. However, the length may vary depending on the availability of research funding from the major professor.

c. Stipend and Compensation

The stipends for Research Assistantships are as follows:

U.S.P./M.S. Students:	\$625 biweekly
M.S. Students:	\$675 biweekly
Ph.D. Students (no M.S.):	\$700 biweekly
Ph.D. with M.S. (Pre-Qual.):	\$725 biweekly
Ph.D. with M.S. (Post-Qual.):	\$750 biweekly

These rates are based on a full research assistantship which requires 20 hours per week to be devoted to research-related services. Part-time RAs devote 10 hours per week and are paid half of the stipends listed above.

3. Renewal and Termination of Appointments

(1) All assistants shall maintain satisfactory academic records and progress toward degrees; their assistantships will not be renewed if their academic progress is unsatisfactory.

(2) Appointments are not renewed beyond the end of the academic term during which all degree requirements have been satisfied.

(3) Appointments are not renewed if the assistant's service to the University is unsatisfactory.

(4) Appointments are not renewed if funding is unavailable.

4. Holidays, Vacations and Sick Leave

Teaching and research assistants are not required to work during the following official University holidays:

- a. New Year's Day
- b. Martin Luther King Day
- c. Memorial Day
- d. Independence Day
- e. Labor Day
- f. Presidential Election Day
- g. Thanksgiving Day
- h. Day after Thanksgiving
- i. Christmas Day

However, since TAs and RAs are classified as temporary employees of the University, they are not eligible to receive vacations and sick leave with pay. During the period between semesters, students are expected to devote full-time work to their research projects. The only exception to this rule is the period between Christmas Eve and New Year's Day, December 24th – January 2nd.

Appendix A

Special Requirements for Entry into Mechanical Engineering Programs

1. Any graduate of an ABET accredited Mechanical Engineering program may enter the ME graduate program directly. However, some of the graduate courses assume certain ME undergraduate work as prerequisites. These prerequisites may have to be taken if they were not part of the student's undergraduate program.
2. Students with an engineering degree in a major other than Mechanical Engineering and students holding non-engineering Bachelor's degrees must have completed the equivalent of, or must complete with a grade of B or better within the first semester of graduate study, the following courses:

ME 325	Elements of Heat Transfer
ME 330	Fluid Mechanics
ME 344	Mechanical Design
ME 440	Design of Control Systems

Students lacking the prerequisites for these courses will be given one additional semester to meet the above requirements.

Appendix B

Mechanical Engineering Graduate Student Profile

Today's Date: _____ Date Degree Expected: _____

Last Name: _____ First Name: _____

Student ID Number: _____ E-Mail: _____

Gender: (check one) Male _____ Female _____ Citizenship: _____

Current Street Address: _____

City, State, Zip Code: _____

Home Phone Number: _____ Alternate Phone Number: _____

Permanent Address: _____

City, State, Zip Code: _____

Name of Emergency Contact (within the United States): _____

Emergency Contact Phone Number: _____ Relationship: _____

Program: (check one)

M.S. Option A (thesis) _____ M.S. Option B (course) _____

Ph.D. without M.S. _____ Ph.D. with M.S. _____

**Ph.D. students only: Date you expect to take the Qualifying Exam: _____

Faculty Advisor: _____

Assistantship: (check one, if applicable) RA _____ TA _____ GA _____ FS _____

Office/Lab Location: _____ Desk Number: _____ Office/Lab Phone: _____

Technical Area: (check one)

Mechanics ____ Thermal-Fluids ____ Systems & Design ____ Manufacturing ____ Paducah ____

Thesis Topic: (if applicable) _____

Appendix C1

Mechanical Engineering Master of Science Plan of Study (Option A)

Last Name: _____ First Name: _____ SID#: _____

Committee Chair: _____ Date Degree Expected: _____

Thesis Topic: _____

Declare Area:

Mechanics _____ Thermal Fluids _____ Systems and Design _____ Manufacturing _____

COURSES REQUIRED TO SATISFY DEGREE REQUIREMENTS				
Core Courses (Must select 4)				
No.	Title	Number	Date Completed	Grade
1				
2				
3				
4				
Related Courses (Must select 2)				
5				
6				
Mathematics Requirement (Must select 2 to be taken during first year.)				
7				
8				
Notes: a) At least 12 hours must be at the 600 level or greater. b) All course substitutions must be approved by the Advisor & DGS prior to enrollment. c) Only 2 independent (project) work courses (ME 780) may count towards satisfying the degree requirements. These courses will only be counted towards the degree IF the project content is NOT related to the students thesis topic. d) All special project course requests (ME 780) must include a project description and course syllabus from the Professor and must be submitted with this form for approval. e) Oral exam committee chair and presentation topic must be selected before the final semester.				

Concurrent degree program, if any: _____

EXTRA COURSES & COURSES OUTSIDE OF DEPT. (INCLUDING CONCURRENT)					
No.	Title	Number	Date Completed	Grade	Concurrent Program
1					
2					
3					
4					
5					
6					
7					

Signature

Date

Student: _____

Advisor: _____

Director of Graduate Studies: _____

All students must file a Plan of Study EACH SEMESTER, even if there are no changes. Only those courses listed on this form will count towards a student's degree program. Advisors of students that register for courses not listed on this form will be notified and the students may be dropped from the courses.

Appendix C2

Mechanical Engineering Master of Science Plan of Study (Option B)

Last Name: _____ First Name: _____ SID#: _____

Committee Chair: _____ Date Degree Expected: _____

Oral Exam Presentation Topic: _____

COURSES REQUIRED TO SATISFY DEGREE REQUIREMENTS				
600 Level Courses (Must select 5)				
No.	Title	Number	Date Completed	Grade
1				
2				
3				
4				
5				
500 Level Courses (Must select 3)				
6				
7				
8				
Mathematics Requirement (Must select 2 to be taken during first year.)				
9				
10				
Notes: a) At least 15 hours must be at the 600 level or greater. b) All course substitutions must be approved by the Advisor & DGS prior to enrollment. c) Only 2 independent (project) work courses (ME 780) may count towards satisfying the degree requirements. These courses will only be counted towards the degree IF the project content is NOT related to the students thesis topic. d) All special project course requests (ME 780) must include a project description and course syllabus from the Professor and must be submitted with this form for approval. e) Oral exam committee chair and presentation topic must be selected before the final semester.				

Concurrent degree program, if any: _____

EXTRA COURSES & COURSES OUTSIDE OF DEPT. (INCLUDING CONCURRENT)					
No.	Title	Number	Date Completed	Grade	Concurrent Program
1					
2					
3					
4					
5					
6					
7					

Signature

Date

Student: _____

Advisor: _____

Director of Graduate Studies: _____

All students must file a Plan of Study EACH SEMESTER, even if there are no changes. Only those courses listed on this form will count towards a student's degree program. Advisors of students that register for courses not listed on this form will be notified and the students may be dropped from the courses.

**Appendix C3
Mechanical Engineering Ph.D. Plan of Study (No Prior MS)**

Last Name: _____ First Name: _____ SID#: _____

Advisor: _____ Date Degree Expected: _____

Dissertation Topic: _____

Mechanics _____ Thermal Fluids _____ Systems and Design _____ Manufacturing _____

COURSES REQUIRED TO SATISFY DEGREE REQUIREMENTS				
Primary Area Courses (Must select 13)				
No.	Title	Number	Date Completed	Grade
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
Mathematics Requirements (Must select 3 per Appendix M of the handbook!) (Must be taken during first year of program.)				
No.	Title	Number	Date Completed	Grade
14				
15				
16				
Notes: a) At least 24 hours must be at the 600-level or greater. b) At least 24 hours must be in the ME department. c) No more than 9 hours may be ME 599 or ME 699. d) Only 2 independent (project) work courses (ME 780) may count towards satisfying the degree requirements. These courses will only be counted towards the degree IF the project content is NOT related to the students thesis topic. All ME 780 courses must include a project description and course syllabus from the Professor and must be submitted with this form for approval. e) No more than 9 credit hours may be waived based on courses taken at other institutions. All course substitutions and waivers must be approved by the Advisor & DGS prior to enrollment. f) All required courses must be completed and the Ph.D. qualifying exam passed before the student can enroll in the Post Qualifying Residency Requirement courses (ME 767 or ME 769).				
EXTRA COURSES, AUDITED COURSES, COURSES OUTSIDE OF DEPARTMENT				
No.	Title	Number	Date Completed	Grade
1				
2				

Semester began program _____ Date completed Pre-Qualifying Exam _____ Date completed Written Qualifying Exam _____ Date completed Oral Qualifying Exam _____

Signature

Date

Student: _____

Advisor: _____

Director of Graduate Studies: _____

All students must file a Plan of Study EACH SEMESTER, even if there are no changes. Only those courses listed on this form will count towards a student's degree program. Advisors of students that register for courses not listed on this form will be notified and the students may be dropped from the courses.

Appendix C4
Mechanical Engineering Ph.D. Plan of Study (Prior/Concurrent MS)

Last Name: _____ First Name: _____ SID#: _____

Advisor: _____ Date Degree Expected: _____

Dissertation Topic: _____

Mechanics _____ Thermal Fluids _____ Systems and Design _____ Manufacturing _____

COURSES REQUIRED TO SATISFY DEGREE REQUIREMENTS				
Primary Area Courses (Must select 5)				
No.	Title	Number	Date Completed	Grade
1				
2				
3				
4				
5				
6*				
Mathematics Requirements (Must select 3 per Appendix M of the handbook!) (Must be taken during first year of program.)				
No.	Title	Number	Date Completed	Grade
7				
8				
9*				
<p>* Only one of these two rows will be completed, depending on if you are transferring a mathematics course in from a previous M.S. degree.</p> <p>Notes: a) At least 12 hours must be at the 600-level or greater. b) At least 12 hours must be in the ME department. c) No more than 9 hours (including those taken for MS) may be ME 599 or ME 699. d) Only 2 independent (project) work courses (ME 780) may count towards satisfying the degree requirements. These courses will only be counted towards the degree IF the project content is NOT related to the students thesis topic. All ME 780 courses must include a project description and course syllabus from the Professor and must be submitted with this form for approval. e) No more than 9 credit hours may be waived based on courses taken at other institutions. All course substitutions and waivers must be approved by the Advisor & DGS prior to enrollment. f) All required courses must be completed and the Ph.D. qualifying exam passed before the student can enroll in the Post Qualifying Residency Requirement courses (ME 767 or ME 769). g) Concurrent MS/PhD students must file both this form and the appropriate MS plan of study.</p>				
EXTRA COURSES, AUDITED COURSES, COURSES OUTSIDE OF DEPARTMENT				
No.	Title	Number	Date Completed	Grade
1				
2				
3				

Semester began program _____ Date completed Pre-Qualifying Exam _____ Date completed Written Qualifying Exam _____ Date completed Oral Qualifying Exam _____

Signature

Date

Student: _____

Advisor: _____

Director of Graduate Studies: _____

All students must file a Plan of Study EACH SEMESTER, even if there are no changes. Only those courses listed on this form will count towards a student's degree program. Advisors of students that register for courses not listed on this form will be notified and the students may be dropped from the courses.

Appendix D1

MSME Program Requirements Manufacturing Area

In addition to an acceptable thesis the student in Option A must earn a minimum of 24 graduate credits in the following courses. Students in Option B must earn a minimum of 30 graduate credits in the following courses. At least two-thirds of the coursework must be in the Mechanical Engineering Department, at least two-thirds must be in regular courses, and at least half (Option B - 15 hours) must be at the 600 level or above.

Core Courses (select at least four)

- ME 503 Lean Manufacturing Principles and Practices
- ME 505 Modeling of Manufacturing Processes and Machines
- ME 507 Design for Manufacturing
- ME 512 Manufacturing Systems
- ME 606 Seminar and Project in Manufacturing Systems Engineering
- ME 607 Analysis of Metal Cutting Processes
- ME 608 Non-Traditional Manufacturing Process
- MFS 563 Simulation of Industrial Production Systems
- MFS 605 Systems for Factory Information and Control
- ME 699 Topics in ME: Sustainable Products, Processes and Systems
- ME 699 Topics in ME: Computational Techniques in Mechanical Systems Design

Related Courses (select at least two)

- ME 501 Mechanical Engineering Design with Finite Element Methods
- ME 599 Topics in Mechanical Engineering (with approval of advisor)
- ME 603 Mechanics of Plastics Solids I
- ME 610 Engineering Acoustics
- ME 641 Foundations of Solid Mechanics
- ME 645 Advanced Control System Analysis
- ME 647 Systems Optimization I
- ME 651 Mechanics of Elastic Solids I

Mathematics Courses (select two)

- EE 420G Electrical Engineering Analysis I
- EGR 537 Numerical Analysis
- MA 433G Introduction to Complex Variables
- MA 481G Differential Equations I
- MA 485G Fourier Series and Boundary Value Problems
- ME 585 Fourier Series and Boundary Value Problems
- ME 611 Boundary Elements Methods in Engineering
- ME 653 Methods of Applied Differential Equations
- MFS 699 Topics in MFS: Six Sigma and Quality Control

Auxiliary Elective Courses (Option B)

- EE 530 Robotics
- EE 611 Deterministic Systems
- ME 506 Mechanics of Composite Materials
- ME 513 Mechanical Vibrations
- ME 532 Advanced Strength of Materials
- MFS 599 Topics in MFS: Design of Lean Production Systems

Appendix D2

MSME Program Requirements Mechanics Area

In addition to an acceptable thesis the student in Option A must earn a minimum of 24 graduate credits in the following courses. Students in Option B must earn a minimum of 30 graduate credits in the following courses. At least two-thirds of the coursework must be in the Mechanical Engineering Department, at least two-thirds must be in regular courses, and at least half (Option B - 15 hours) must be at the 600 level or above.

Core Courses (select at least four)

- ME 506 Mechanics of Composite Materials
- ME 513 Mechanical Vibrations
- ME 532 Advanced Strength of Materials
- ME 641 Foundations of Solid Mechanics
- ME 644 Advanced Dynamics I

Related Courses (select at least two)

- ME 602 Dynamics of Distributed Mechanical Systems
- ME 603 Mechanics of Plastic Solids I
- ME 610 Engineering Acoustics
- ME 611 Boundary Element Methods in Engineering
- ME 613 Nonlinear Oscillations
- ME 651 Mechanics of Elastic Solids I
- CE 699 Topics in CE: Advanced Finite Element Analysis in Engineering
- CE 783 Structural Finite Element Analysis

Mathematics Courses (select two)

- MA 485G Fourier Series and Boundary Value Problems
- MA 506 Methods of Theoretical Physics I
- MA 507 Methods of Theoretical Physics II
- MA 522 Matrix Theory and Numerical Linear Algebra I
- MA 527 Applied Mathematics in the Natural Sciences I
- MA 537 Numerical Analysis
- ME 653 Methods of Applied Differential Equations

Auxiliary Elective Courses (Option B)

- ME 531 Fluid Dynamics I
- ME 556 Introduction to Composite Materials
- ME 599 Topics in Mechanical Engineering (with approval of advisor)
- ME 607 Analysis of Metal Cutting Processes
- ME 699 Topics in ME: Computational Techniques in Mechanical Systems Design

Appendix D3

MSME Program Requirements Systems and Design Area

In addition to an acceptable thesis the student in Option A must earn a minimum of 24 graduate credits in the following courses. Students in Option B must earn a minimum of 30 graduate credits in the following courses. At least two-thirds of the coursework must be in the Mechanical Engineering Department, at least two-thirds must be in regular courses, and at least half (Option B - 15 hours) must be at the 600 level or above.

Core Courses (select at least four)

ME 501	Mechanical Design with Finite Elements Methods
ME 602	Dynamics of Distributed Mechanical Systems
ME 610	Engineering Acoustics
ME 611	Boundary Element Methods in Engineering
ME 645	Advanced Control System Analysis
ME 647	System Optimization I
ME 699	Topics in ME: Computational Techniques in Mechanical Systems Design

Related Courses (select at least two)

CE 783	Structural Finite Element Analysis
ME 507	Design for Manufacturing
ME 513	Mechanical Vibrations
ME 532	Advanced Strength of Materials
ME 644	Advanced Dynamics I

Mathematics Courses (select two)

EGR 537	Numerical Analysis
MA 432G	Methods of Applied Mathematics
MA 433G	Introduction to Complex Variables
MA 471G	Advanced Calculus I
MA 472G	Advanced Calculus II
MA 481G	Differential Equations
MA 483G	Introduction to Partial Differential Equations
MA 522	Matrix Theory and Numerical Linear Algebra I
MA 565	Linear Algebra
ME 585	Fourier Series and Boundary Value Problems

Auxiliary Elective Courses (Option B)

EE 517	Advanced Electromechanics
EE 611	Deterministic Systems
ME 506	Mechanics of Composite Materials
ME 503	Lean Manufacturing Principles and Practices
ME 505	Modeling of Manufacturing Processes and Machines
ME 512	Manufacturing Systems
ME 607	Analysis of Metal Cutting Processes
MFS 605	Systems for Factory Information and Control

Appendix D4

MSME Program Requirements Thermal-Fluid Sciences Area

In addition to an acceptable thesis the student in Option A must earn a minimum of 24 graduate credits in the following courses. Students in Option B must earn a minimum of 30 graduate credits in the following courses. At least two-thirds of the coursework must be in the Mechanical Engineering Department, at least two-thirds must be in regular courses, and at least half (Option B - 15 hours) must be at the 600 level or above.

Core Courses (select at least four)

ME 531	Fluid Dynamics I
ME 620	Advanced Engineering Thermodynamics I
ME 626	Advanced Heat Convection
ME 627	Radiation Heat Transfer
ME 628	Boiling and Condensation
ME 631	Fluid Dynamics II

Related Courses (select at least two)

ME 530	Gas Dynamics
ME 560	Engineering Optics
ME 563	Basic Combustion Phenomena
ME 599	Topics in Mechanical Engineering (with approval of advisor)
ME 610	Engineering Acoustics
ME 634	Turbulent Flows
ME 690	Advanced Algorithms for Computational Fluid Dynamics
ME 699	Topics in Mechanical Engineering (with approval of advisor)

Mathematics Courses (select two)

ME 611	Boundary Elements Methods in Engineering
MA 432G	Methods Applied Math I
MA 433G	Introduction to Complex Variables
MA 481G	Differential Equations
MA 485G	Fourier Series and Boundary Value Problems
EGR 537	Numerical Analysis

Appendix D5

MSME Graduate Course Options – Non-Thesis (Option B) Availability for Paducah

Advanced Mathematics Courses (400-level or above) – at least 6 credit hours from:

MA 432G	Methods of Applied Mathematics I
MA 433G	Introduction to Complex Variables
MA 481G	Differential Equations I
MA 485G	Fourier Series and Boundary Value Problems
MA 537	Numerical Analysis

(Equivalent math courses may be taken from Murray State and transferred to UK)

600-Level Courses – at least 15 credit hours from:

MFS 605	Systems for Factory Information and Control
ME 610	Engineering Acoustics
ME 620	Advanced Engineering Thermodynamics I
ME 626	Advanced Heat Transfer
ME 644	Advanced Dynamics I
ME 699	Topics in ME: Computational Techniques in Mechanical Systems Design
ME 780	Special Problems in Mechanical Engineering

500-Level (or above) Courses – no more than 9 credit hours from:

ME 501	Mechanical Design with Finite Elements Methods
ME 513	Mechanical Vibrations
ME 530	Gas Dynamics
ME 531	Fluid Dynamics I
ME 580	Heating, Ventilating, and Air-Conditioning
ME 599	Topics in ME: Power Generation
ME 599	Topics in ME: Aerodynamics of Turbomachinery

(Other available courses with approval of advisor and DGS)

Total Credit Hour Requirements = 30

At least half (Option B = 15 hours) must be at the 600-level or above.

Appendix E

M.S. Option B – Final Examination Guidelines

The Final Examination will be conducted by an examination committee comprised of at least three (3) Mechanical Engineering Faculty. This committee must be appointed at the beginning of the student's final semester, and in accordance with the deadlines set forth by the graduate school. (It is the student's responsibility to obtain the Examination Committee appointment form and to ask appropriate faculty members to serve on the committee.) Unless modified by the Examination Committee, the following guidelines will be used during the examination:

There will be two (2) distinct portions of the Final Examination:

1. Student presentation of a project with Faculty questions regarding the project; and
2. Faculty questions on the subject matter covered in the students MS coursework.

In order to pass the Final Exam, students must satisfactorily answer questions in BOTH of these areas. **The Student Project must be selected in consultation with the Examination Committee and approved, in advance of the Examination, by the Examination Committee Chair.** The detailed format of the final examination is at the discretion of the Final Examination Committee and, is in accordance with Graduate School requirements. However, unless modified by the Examination Committee, the following requirements are to be met:

1. The Student Project Presentation should be done using PowerPoint slides and in a professional manner. The presentation should take no more than 25-30 minutes.
2. Each slide in the presentation must be numbered.
3. The first slide of the presentation (just before the title slide), must give the student's name and list each of the courses taken in pursuit of the Option B Masters degree (including the semester in which each course was taken.)
4. The student must bring hard copies of the presentation for each of the committee members.

Appendix G

Preliminary Ph.D. Committee
(Only for Ph.D. students)

The members listed on this form can be different from the final committee members submitted to the Graduate School. This form is solely used by the Department of Mechanical Engineering. The function of the committee members is to perform a preliminary evaluation of the Ph.D. student's qualifications to continue in the program after the end of the first semester. It is required that this form is submitted within three months after enrollment in the Ph.D. program. The student should consult with his/her thesis advisor to select his/her committee members.

Semester began program: _____

Anticipated Date of Pre-Qualifying Exam: _____

Student's Name: _____

Student ID Number: _____

Mailing Address: _____

E-Mail Address: _____

Thesis Advisor: _____

Declare Area:

Mechanics _____ Thermal-Fluids _____ Systems and Design _____ Manufacturing _____

Thesis Topic: _____

Committee Members:

	<u>Name</u>	<u>Signature</u>
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____

Signature

Date

Student: _____

Advisor: _____

Director of Graduate Studies: _____

Appendix H

Pre-Qualifying Examination Evaluation

(Only for Ph.D. students)

Pre-Qualifying Examination of: _____		Student ID Number: _____	
Date: _____	Exam Type: (circle one)	Oral	Written
Committee Members:	Member Signatures:	Member Votes: (circle one)	Majority Opinion:
1. _____	_____	Pass Fail	<input type="checkbox"/> Pass
2. _____	_____	Pass Fail	
3. _____	_____	Pass Fail	<input type="checkbox"/> Fail
4. _____	_____	Pass Fail	
Director of Graduate Studies: _____		Date: _____	

Appendix I

Departmental Procedure for Ph.D. Qualifying Examination

The Qualifying Examination consists of both written and oral components. The written part of the Qualifying Examination is satisfied by passing a written examination which is administered by the Director of Graduate Studies, while the oral part is satisfied by passing an oral examination, including the research proposal, conducted by the student's advisory committee.

1. Examination Procedure

- 1-1. Each student must select three Area Exams from the list in Appendix L (with the exception that one of the three might be a Research Area Exam).
- 1-2. Students who wish to take any Area Exam must inform the DGS at least one month before the end of the semester prior to that in which the exam is to be taken. Research Area Exams must be proposed by the advisory committee at least one month before the end of the semester prior to that in which the exam is to be taken.
- 1-3. Area Exams are three hours (closed book). Each exam will consist of two problems each from three courses (six problems total) from which the student selects four to be graded.
- 1-4. A minimum total performance of 70.0% in each Area Exam is necessary to pass that examination.
- 1-5. Results will be announced on Monday of the fifth week of the semester.
- 1-6. All three Area Exams must be passed in order to pass the Preliminary Examination. Upon passing, the student can then take the oral part of the Qualifying Examination.
- 1-7. Students who fail two or more Area Exams must take all three Area Exams within the next 12 months. Students who fail one Area Exam are allowed to repeat that Area Exam the following semester OR to select another Area Exam to be taken no later than 12 months from the first Preliminary Exam attempt.
- 1-8. Only two attempts to pass the Preliminary Examination are allowed. At the conclusion of the second attempt, three subject areas must have been passed, otherwise further consideration will be given by the department appeals committee.

Any appeal must be submitted in writing to the DGS within two weeks of the date of the announcement of the results. Appeals based on merit will be handled by the DGS and the Technical Area Committee. Regrading must be done by the original grader. Appeals based on procedure will be heard and decided by the ME Graduate Studies Committee. Further appeals will be heard through the regular and established university channels.

Appendix J

Application for the Written Portion of the Qualifying Examination

This request can only be submitted after passing the Pre-Qualifying Examination. The student must select three of the areas listed below. A special area exam can be selected to replace one of the subject areas. However, this request should be accompanied by a letter of request from the thesis committee to the DGS. This letter should include three courses that will make up the exam.

Semester began program: _____

Student's Name: _____ Student ID Number: _____

Mailing Address: _____

E-Mail Address: _____

Dissertation Advisor: _____

Declare Area:

Mechanics _____ Thermal-Fluids _____ Systems and Design _____ Manufacturing _____

Dissertation Topic: _____

Manufacturing

Manufacturing Processes _____

Manufacturing Systems _____

Mechanics

Dynamics and Vibrations _____

Solid Mechanics _____

Systems and Design

Mechanical Design and Acoustics _____

Systems Design and Control _____

Thermal-Fluid Science

Fluid Mechanics _____

Heat Transfer and Combustion _____

Special Emerging Area:

Appendix K

Written Portion of the Qualifying Examination

For the written portion of the Qualifying Exam, a doctoral student must select three of the Area Exams listed below. Three courses are listed for each exam, including at least one 600-level course. There will be two problems from the subject of each listed course. Students are expected to attempt 4 problems and demonstrate a passing level of performance.

Instead of one of the above pre-approved Area Exams grouped by Major Subject below, a doctoral student may select a Research Area Exam proposed by his/her advisory committee as described below. This exam must also be based on three courses, including one 600-level course, and must include two problems from each course. This exam is intended to focus on unique coursework that a student has taken for research in a specific field or interdisciplinary subject.

Manufacturing

Manufacturing Processes	ME 505, ME 507, ME 607
Manufacturing Systems	ME 503, ME 512, MFS 605

Mechanics

Dynamics and Vibrations	ME 513, ME 602, ME 644
Solid Mechanics	ME 506, ME 532, ME 641

Systems and Design

Mechanical Design and Acoustics	ME 501, ME 610, ME 611
Systems Design and Control	ME 514, ME 645, ME 647

Thermal-Fluid Science

Fluid Mechanics	ME 530, ME 531, ME 631
Heat Transfer and Combustion	ME 563, ME 626, ME 627

Research Area Exam

A Research Area Exam is proposed (including the list of three courses other than those listed above and including at least one 600-level course) by the student's advisory committee, is approved by the ME graduate studies committee, is prepared/coordinated by a member of the student's advisory committee (not the major advisor), is administered during the same two weeks as the Area Exams, and otherwise subject to the same rules and standards as pre-approved Area Exams.

Appendix L

Procedure for the Oral Portion of the Qualifying Examination

- 2-1. Once the student passes the written part of the Qualifying Examination, the student can take the oral part of the Qualifying Examination.
- 2-2. The student must schedule his/her oral part of the Qualifying Examination during the first six weeks of the semester as well as pass this part of the exam during the semester in order for that semester to count as the student's post qualifying residency. A two-week notice is required by the Graduate School to set an examination date.
- 2-3. Members of the Advisory Committee must be given a copy of the candidate's "Prospectus" two weeks in advance of the oral part of the Qualifying Examination date. The Prospectus should document the nature, significance, methodology, and the expected outcome of the dissertation research.
- 2-4. The Advisory Committee of each student is responsible for deciding the structure of the oral examination, for administering the oral examination and for evaluating the result of the Qualifying Examination.

Appendix M

Ph.D. Mathematics Requirement

1. The mathematics requirement for the Ph.D. degree in mechanical engineering may be satisfied by completing three courses chosen from the following list. Approval of the courses by the student's advisor and the DGS is required (Appendix D).

Any 400G-, 500-, or 600-level courses offered by the Department of Mathematics, except MA 432G.

No more than one of the following:

CE 783	Structural Finite Element Analysis
CE 699	Advanced Finite Element Analysis in Engineering
CME 780	FE Methods for Fluid Dynamics and Transport Processes
EE 525	Numerical methods and Electromagnetics
EE 625	Computational Electromagnetics
ME 690	Advanced Algorithms for Computational Fluid Dynamics

2. A grade of B or better is required in each course used to satisfy this requirement.
3. At least one of the three courses must be outside of the area of numerical analysis and offered by the Department of Mathematics.
4. At least one of the three courses must be a 500 or higher level course earned in graduate standing.
5. No more than one graduate-level mathematics course from other institutions or a previous M.S. degree may be applied toward this requirement. However, all such courses will be subject to all conditions given above and the approval of the DGS.
6. If a student has an extensive math background (e.g., a Masters degree in mathematics or applied mathematics), exceptions to conditions (1), (2), or (3) may be proposed by the student's advisor and approved by the DGS.

Appendix N

Mechanical Engineering Graduate Student Exit Interview

Name: _____ Student ID Number: _____

Degree Awarded: _____ Date: _____

Name of Prospective Employer/Graduate School: _____

City State/Country Zip

Salary: _____ Permanent E-Mail Address: _____

Forwarding Address: _____

City State/Country Zip

_____ Thesis/Dissertation submitted to advisor (n/a for Option B students)

_____ Returned keys to office, desk and/or building
(key numbers: _____)

_____ Office Check-Out (no papers or books left in desk or office)

_____ Lab Check-Out (lab was clean and orderly)

_____ Returned books/solution manuals (TAs only)

_____ University of Kentucky Employee Separation Form
(required by payroll)

Signature

Date

Student: _____

Advisor: _____

Director of Graduate Studies: _____

Appendix O

Graduate School Forms

Please retrieve copies of all Graduate School forms at: <http://www.research.uky.edu/gs/gforms.html>. Questions about these forms should be directed to Jonathan Garrett in the Graduate School, 257-2591, jgarret@uky.edu.

- **Add/Drop Worksheet**
- **Request for Credit Overload**
- **Extension of Incomplete (“I”) Grade**
- **Request for Post Mid-Term Withdrawal**
- **Request for Repeat Option**
- **University Scholars Program Application**
- **Concurrent Master’s Degrees Form**
- **Transfer of Credit Form**
- **Application for Degree**
Must be submitted electronically within first four (4) weeks of graduating semester via myUK. After logging in, click on Student Services -> myRecords -> Graduate Degree Application.
- **Request for Final Master’s Degree Examination** (M.S. students only)
Must be submitted with Thesis Approval Form no later than two (2) weeks prior to exam date. Last day to sit for an exam is the Thursday prior to Dead Week in order to graduate during the current semester.
- **Thesis Approval Form** (M.S. students only)
Must be submitted with Request for Final Examination no later than two (2) weeks prior to exam date. Approval of the thesis at this stage is confirming that it is ready to defend, and the final thesis should be brought to Graduate School after the exam to review for final formatting.
- **Electronic Master’s Thesis Approval Form** (M.S. students only)
- **Formation of an Advisory Committee** (Ph.D. students only)
Must be submitted electronically within the first year of study as a Ph.D. student.
http://www.research.uky.edu/cfdocs/gs/DoctoralCommittee/Selection_Screen.cfm
- **Recommendation for Qualifying Examination** (Ph.D. students only)
Must be submitted electronically no later than two (2) weeks prior to exam date.
http://www.research.uky.edu/cfdocs/gs/DoctoralCommittee/Selection_Screen.cfm
- **Notification of Intent to Schedule a Final Doctoral Examination** (Ph.D. candidates only)
Must be submitted electronically eight (8) weeks prior to anticipated exam date.
http://www.research.uky.edu/cfdocs/gs/DoctoralCommittee/Selection_Screen.cfm
- **Request for Final Doctoral Examination** (Ph.D. candidates only)
Must be submitted electronically no later than two (2) weeks prior to exam date.
http://www.research.uky.edu/cfdocs/gs/DoctoralCommittee/Selection_Screen.cfm
- **Electronic Doctoral Dissertation Approval Form** (Ph.D. candidates only)

Copies of all forms must be submitted to Jill Fisher, 155 Ralph G. Anderson Building, upon submission to the appropriate Graduate School office (noted on each form).

NAME: _____ STUDENT ID: _____
Last First M.I.

CURRENT ADDRESS: _____

E-MAIL ADDRESS: _____ TELEPHONE #: _____

I wish to exercise the repeat option granted me under University Regulations for:

COURSE TITLE: _____

PREFIX-NUMBER: _____ SECTION: _____ CREDIT HR: _____

Course repeated in: YEAR _____ FALL SPRING 1ST SUMMER SESSION 2ND SUMMER SESSION

I initially took this course in: YEAR _____ FALL SPRING 1ST SUMMER SESSION 2ND SUMMER SESSION

I initially received a grade of: _____

SIGNATURES: _____ DATE: _____
Student

Director of Graduate Studies DEPT.: _____ DATE: _____

Return the completed form to The Graduate School, Room 202, The Gillis Building, University of Kentucky, Lexington, KY 40506-0033

APPROVED: YES NO _____ DATE: _____
Senior Associate Dean

ENTERED: _____ NOTIFIED: _____

UNIVERSITY SCHOLARS PROGRAM PLAN SHEET

NAME: _____
Last
First
M.I.

SOCIAL SECURITY #: ____/____/____

GRADUATE LEVEL COURSES USED FOR UNDERGRADUATE CREDIT ONLY		GRADUATE LEVEL COURSES TO BE COUNTED TOWARD BOTH DEGREES (maximum of 12 hours)		GRADUATE LEVEL COURSES USED FOR GRADUATE CREDIT ONLY	
COURSE PREFIX-NUMBER	CREDIT HR	COURSE PREFIX-NUMBER	CREDIT HR	COURSE PREFIX-NUMBER	CREDIT HR
TOTAL CREDITS: _____		TOTAL CREDITS: _____		TOTAL CREDITS: _____	

PLAN A MASTERS
 PLAN B MASTERS

I APPROVE THIS UNIVERSITY SCHOLARS PROGRAM PLAN:

_____ DATE: _____
 Director of Graduate Studies

FORMULA FOR DEGREE:

TOTAL NUMBER OF HOURS REQUIRED FOR BACHELOR'S DEGREE: _____

PLUS TOTAL NUMBER OF HOURS REQUIRED FOR MASTER'S DEGREE: _____

SUB-TOTAL: _____

MINUS NUMBER OF HOURS ALLOWED AS CROSSOVERS (12 MAXIMUM): _____

SUB-TOTAL: _____

MINUS TOTAL NUMBER OF HOURS REQUIRED FOR BACHELOR'S DEGREE: _____

TOTAL NUMBER OF GRADUATE CREDITS REQUIRED FOR MASTERS DEGREE: _____

