

# GRADUATE STUDENT HANDBOOK

Manufacturing Systems Engineering MS Program  
2018-2019

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# 1. Introduction

The Manufacturing Systems Engineering MS (MFS) program is a multidisciplinary program that is managed by the Mechanical Engineering department. It is administered by a multidisciplinary Faculty Advisory Committee drawing on manufacturing expertise across the College of Engineering. The Committee will also typically consist of one or more members from departments outside the College of Engineering, which by their nature have an affiliation with manufacturing. The faculty are also active in the teaching of courses in the program and are engaged in world-class, cutting-edge research in manufacturing and related areas. As a result the program provides an intellectually challenging environment in which students can pursue advanced studies and engage in research.

## 2. Admission to the MFS Program

### A. Classification of Students

Currently, students undertaking graduate work are classified by the Graduate School in 1 of 2 categories, degree students or post-baccalaureate students. Degree students are further classified as regular, conditional, or dual degree. Finally, the University Scholars Program is available for under-graduate students with a minimum of 90 hours, accepted GPA, and senior standing. See Admission Requirements for more detail.

#### I. Regular Students

Regular students must satisfy all admission requirements and be accepted by both the Graduate School and the MFS Degree Program.

#### II. Conditional Students

A student who wishes to pursue a higher degree, but who, for 1 or more of the reasons listed below, is temporarily ineligible for regular admission status may be recommended by the Director of Graduate Studies as a conditional student:

- Missing transcripts or other requirements for admission such as letters of recommendation.
- Temporary waiver of the Graduate Record Examination.
- Deficiencies of undergraduate courses in engineering.
- Graduating University of Kentucky seniors lacking no more than six hours for graduation. The consent of the College Dean and the Dean of the Graduate School and approval of the Director of Graduate Studies are necessary. Such students may take no more than twelve credit hours and must complete the undergraduate degree during the semester in which they enroll in the conditional status.

### **III. Post-baccalaureate Students**

Students who hold a baccalaureate degree and who wish to pursue graduate study without a degree objective and students who do not fulfill the entrance requirements of The Graduate School may apply for admission as post-baccalaureate graduate students. A 2.5 grade point average in a 4.0 scale is required. Admission to this status may be granted to an applicant who (1) demonstrates promise but has not qualified for admission to a degree program, or (2) intends not to complete a degree program. Students may take courses for graduate credit but may not apply more than 9 hours credit with a grade of A or B earned in the post-baccalaureate status to any degree program leading to an advanced degree at this institution. All transfers of credit hours to a graduate program must be approved by that program's Director of Graduate Studies (DGS) and the Graduate Dean. Post-baccalaureate students who wish to apply for a graduate program should notify the Graduate School by updating their existing graduate school application. Applicants must have a 3.0 grade point average on all work attempted as post-baccalaureate students.

### **IV. Dual Degree**

Students enrolled in electrical or mechanical engineering who have a minimum cumulative undergraduate GPA of 3.00 may enroll in the dual degree program. Such students may take graduate level courses beginning in their junior year provided they've completed at least 90 credit hours. The dual degree program is structured to appeal to engineering students who plan a career in manufacturing.

### **V. University Scholars Program**

Students in this category must have senior standing, have completed all University studies requirements (a minimum of 90 hours, 3.5 GPA in major, 3.2 GPA overall). The current University Scholars Program provides an opportunity for the very best and brightest students to significantly reduce the time required to complete an undergraduate degree and a master's degree at the University of Kentucky.

## **B. Admission Requirements for Regular Students**

Applicants seeking admission to the Manufacturing Systems Engineering MS Program as regular students must have been awarded a baccalaureate degree with an undergraduate grade point average of at least 2.8 on a 4.0 scale. To be admitted to the MFS Program the applicant must have been awarded a Bachelor of Science degree from an engineering program accredited by ABET. Applicants who have been awarded Bachelor degrees other than engineering or from engineering programs not accredited by ABET (including those offered by institutions outside the United States) may be admitted only if persuasive evidence (test scores, grades, letters of recommendation) indicate strong academic potential. Students with an undergraduate major not in engineering may also need to complete a certain number of undergraduate engineering courses to prepare them for this program. The extent of this will be evaluated by the Director of Graduate Studies (DGS). For additional information contact the Graduate Admissions Officer.

Beginning Fall 2015, GRE scores are not required for admission into the program. However, note that GRE scores must be submitted if you intend to apply for any fellowships (some are available for full-time students, once enrolled in the program).

All international students (except those with a degree from an accredited U.S. institution) must have a minimum score on the language tests. Two systems may be considered: TOEFL or IELTS per Graduate School requirements.

**TOEFL:** Applicants must have a minimum score of 550 (paper), 213 (computer), 79 (Internet).

**IELTS:** Applicants must have an overall band score of at least 6.5.

## **C. Admission Requirements for the University Scholars Program**

(Combined MS/BS Degrees)

The University Scholars Program (USP) offers highly motivated UK graduates the opportunity to integrate undergraduate and graduate courses in a single continuous program culminating in both bachelors and Masters degrees. Students begin the University Scholars Program during the senior year of their undergraduate program.

### **I. Degree Requirements**

- a) Twelve (12) credit hours of graduate work will count for both graduate and undergraduate programs. Requirements for the BS degree are unchanged.
- b) Students may take no more than 16 credit hours per semester unless one or more courses is taken as an audit, or otherwise with a pass/fail grade, except by recommendation of the Director of Graduate Studies (DGS) and approval of the Dean of the Graduate School.
- c) Students must have both undergraduate and graduate advisors.

### **II. Admission Requirements**

- a) Application to the program should be submitted to the DGS by April 30 of the student's junior year.
- b) 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.
- c) The undergraduate GPA must be at least 3.5 in mechanical engineering courses and 3.2 overall.

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

## D. Application for Admission

### I. Regular Status

Applicants for admission as regular students must be admitted to both the Graduate School and the Degree Program.

<b>Application Deadline</b>	<b>Fall Semester</b>	<b>Spring Semester</b>
<b>International Applicants</b>	March 15	August 15
<b>Domestic Applicants</b>	July 15	December 1

(No applications are accepted for the Summer Session.)

The applicant is required to submit the following items to the Graduate School:

- Graduate School Application form
- Payment of the application fee
- 1 official copy of transcripts from all colleges or universities ever attended
- Beginning Fall 2015, GRE scores are not required for admission into the program. However, note that GRE scores must be submitted if you intend to apply for any fellowships (some are available for full-time students, once enrolled in the program). Official TOEFL or IESTL scores. (International students only.) Photocopies not accepted.
- Resume (International students please specify which is your first and which is your family name)
- Statement of Purpose
- 3 letters of recommendation
- To complete the Graduate School Application form and pay your fee online visit the Admissions page of the Graduate School's website.

### II. Post-Baccalaureate Status

All transfers of credit hours to a graduate program must be approved both by that program's Director of Graduate Studies (DGS) and the Graduate Dean. The process for admission as a post-baccalaureate graduate student is:

- Student applies to Graduate School and pays application fee (by credit card). The program code is POBA. A Graduate School admission application (and accompanying transcript) must be on file at least 2 weeks in advance of the registration date for the

term in which the student plans to enroll. Graduate students with post-baccalaureate status have one month after each semester begins to be admitted to a graduate program by the Graduate School. After that deadline the student must wait until the following semester.

- The Graduate School will evaluate the application and notify the student of its decision.
  - Permission to enroll in any graduate course as a post-baccalaureate student will be granted only if space is available and the student meets the prerequisites.

To be admitted to a graduate degree program subsequent to being a post-baccalaureate, a student must:

- Have a 3.0 on all work attempted in post-baccalaureate status
- May not transfer more than 9 hours or 25% of hours required to earn the degree
- Must have earned an A or B in transferred courses
- Must have transfer approved by program's Director of Graduate Studies and the Dean of the Graduate School
- Must comply with all admissions requirements for degree-seeking students to the desired program and state the term for which enrollment is desired

### **III. Dual Degree Status and University Scholar Status**

See the:

- Dual Degree Application Form
- University Scholars Program Application Form

## **E. After Enrollment**

### **I. Orientations**

All new students are encouraged to attend orientation organized by the UK Graduate School. There will be a separate graduate orientation for all MFS students at the beginning of each semester, and all graduate students are required to attend.

### **II. Graduate Student Profile**

The Graduate Program Coordinator (GPC) maintains a personal profile of all MFS graduate students. A *Graduate Student Profile* (see appendix) must be submitted by all new graduate students to the GPC by the end of their second week on campus to ensure that the department has current contact information. An updated *Graduate Student Profile* should be submitted to the GPC immediately after there is any change in contact information or graduate status.



An e-mail listserv is frequently used for general communications with students. All graduate students are subscribed to this mailing list and should check their e-mail at least three times per week if not daily.

### III. Assignment of a Faculty Advisor

The Director of Graduate Studies (DGS) serves as the advisor to each student majoring in Manufacturing Systems Engineering until the student has a permanent advisor. Selection of a faculty adviser is based on the interests of the student, on willingness of the faculty member to accept the student, and concurrence of the DGS. Typically the adviser should be appropriate for directing the thesis of the student, and may also be the principal investigator of a funded project which provides funds for the student's support. The advisor should be selected during the student's first semester in the program.

### IV. Program Planning

New graduate students should meet with a faculty advisor and/or the Program's Director of Graduate Studies to develop a plan of graduate study. This is accomplished by completing the "Plan of Study" form (see appendix), having it signed by the advisor and the Director of Graduate Studies, and filing it with the Director of Graduate Studies. The primary purpose of this effort is to help precisely define the educational objectives of the student and to assure that the student is fully aware of the University's and the Department's degree requirements. **This must be accomplished early in the student's program and, in any case, no later than the end of the first semester of graduate studies.**

### V. Registration

After developing a proposed program with an advisor and/or the DGS, the student may proceed with registration. All UK students must register for classes through myUK, the web portal to their records and other services and information. In addition to the link above, there is a link on the bottom left corner of the UK home page. Visit the [www.uky.edu/registrar/myUK.htm](http://www.uky.edu/registrar/myUK.htm) and/or [www.uky.edu/Registrar/AccSAIS.htm](http://www.uky.edu/Registrar/AccSAIS.htm) for general information. Go to [www.uky.edu/Registrar/docs/myUK.pdf](http://www.uky.edu/Registrar/docs/myUK.pdf) for specific directions to register for classes. Any student who experiences difficulties with this system can contact Graduate Program Coordinator.

Midway through the current term, preregistration for the next semester's courses is held for all currently enrolled students. New students are informed of these 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 during the previous semester, as well as new and readmitted students who applied after the early registration deadline, must register later during the first week of classes.

## VI. Office Space

Office space in the Center for Manufacturing Building is available on a limited basis to graduate students. Contact the Graduate Program Coordinator or your faculty advisor for available spaces.

## VII. Keys

Graduate students frequently re-quire keys for access to University offices, laboratories and buildings. Requests for keys are initiated by completing a *Key Request* form. The student's advisor and the ME Department Chair must certify the validity of each key request.

## F. After Beginning Class Work

### I. Proposed Plan of Study

This must be accomplished early in the student's program and, in any case, no later than the end of the first semester of graduate studies. It should be emphasized that the Plan of Study can, and often will, be changed as the student progresses. Should such a change become necessary, a new Plan of Study should be prepared, following the same procedure as emphasized above.

### II. Application for Degree

To be eligible for a degree, graduate students must file a *Graduate School Application for Degree* using their myUK account. The application deadlines are:

- a) within 30 days after the beginning of the Fall or Spring Semester in which he/she expects to graduate,
- b) or within 15 days after the beginning of summer session.

Further instructions can be found at the Graduate School website.

### III. Time Limits for Degree

No course or equivalent credit may be given for graduate study completed more than eight years prior to the end of the semester at which the student expects to receive a degree. Exceptions to this rule are possible under certain conditions if recommended by the Director of Graduate Studies and subsequently approved by the Dean of the Graduate School and the Graduate Council. No activity completed more than 12 years preceding the proposed graduation date will be considered for graduation.

### IV. Courses and Grades

**Regular Semester:** A full-time graduate student must be 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.

*Summer Term:* Students are expected to conduct full-time research during the summer, so no regularly-scheduled ME graduate courses are offered during this period.

Some of the graduate courses in the MFS program are not offered every semester, some are offered once a year and others once every 2 years. Should a student miss a course while being offered, he/she might not be able to take that course again. The student can avoid this dilemma by planning the program of study well in advance.

## V. **Incomplete Grades**

A grade of "I" (incomplete) may be assigned to a graduate student if a part of the work of a course remains undone and there is a reasonable possibility that a passing grade will result from completion of the work. All incomplete grades must be removed from the student's record before he/she may schedule the final examination or be awarded a degree. Removal may be accomplished in two ways:

- complete requirements for all such courses permitting the instructor(s) to issue official grade change(s);
- provide the Dean of the Graduate School with letters from the student's advisor or special committee Chair, and the DGS, stating that the incomplete course(s) is (are) no longer part of the student's *Plan of Study*.

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

## G. **Review and Dismissal**

Progress of each graduate student will be reviewed by the DGS, in consultation with the Graduate Studies Committee and the student's academic advisor, once each academic year, or more often for students on scholastic probation. If a student does not make satisfactory progress in coursework and/or research, that student shall be dismissed from the MFS graduate program.

### *Conditions for Dismissal*

- Students are unable to achieve a 3.0 cumulative GPA after a semester of scholastic probation.
- Students have completed their formal coursework and/or residence requirements but have not made satisfactory progress toward completion of remaining degree requirements.

### *Dismissal Procedure*

- Dismissal is effective at the end of the semester in which the review is made.

- The student will be notified in writing of potential dismissal with- in four weeks of the beginning of the semester during which the re- view is to be conducted.

## **H. Seminars**

### **I. 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 (WMR) Seminar Series. There will usually be between six and eight seminars each semester. These will typically be held on Fridays from 3:00 to 4:00 p.m.

### **II. Safety Training Seminars**

All graduate students who expect to be involved in laboratory work are expected to attend some safety training seminars as provided by the safety committee of the center and the safety training offered by the university.

### **III. Institute for Sustainable Manufacturing Seminars**

The Institute for Sustainable Manufacturing (ISM) is a multidisciplinary institute in the College of Engineering with faculty from different departments. The ISM periodically hosts internationally reputed speakers in sustainable manufacturing and related areas. The specific dates and times of these seminars will be announced ahead of time.

### **IV. The Power and Energy Institute of Kentucky (PEIK) Seminars**

PEIK offers a series of seminars every semester related to energy issues. These seminars are usually held on Friday afternoons. The specific dates and times will be announced ahead of time.

All MFS students are encouraged to attend these seminars, and attendance will be taken.

### 3. Degree Requirements for the Master of Science Degree

A minimum of twenty-four semester hours of course work plus a thesis (Plan A) or thirty hours of coursework for Plan B (if admitted in or before Spring 2016, thirty-three semester hours including MFS 784 Research Project in Manufacturing Systems Engineering) is required. In no case will independent work, used for part of the thesis be counted as part of the twenty-four hours of course work. The thesis must be actively supervised by a member or associate member of the Graduate Faculty. **Students pursuing this degree under the dual degree option must meet the same requirements as all other students.**

#### A. Program Options

The Master of Science in Manufacturing Systems Engineering is offered through the Graduate School. There are currently two options approved for fulfilling the requirements for the MS degree:

##### I. Plan A (Thesis)

This program provides for study and research leading to the degree of Master of Science in Manufacturing Systems Engineering. The thesis plan requires twenty-four credit hours of course work and a thesis. Per Graduate School requirements, one-half or more of the coursework must be at the 600 level (graduate credit only) or above. All students will be required to complete four specified core courses [MFS 505, MFS 605, MFS 606, MFS 613 (MFS 611, if admitted in or before Spring 2016)]. The electives for each student will be developed in conjunction with a faculty adviser to insure that the program provides breadth and depth of content for the student, and meets the specific needs and interests of the student.

The coursework consists of the following (see [Course Descriptions](#)), excerpted from the University Bulletin. For a recommended sequence of courses for Plan A, see Appendix B:

<b>MFS 606</b>	Global Issues In Manufacturing	3 hr
<b>MFS 605</b>	Modeling Simulation and Control for Manufacturing	3 hr
<b>MFS 613</b>	Sustainability, Ethics and Leadership in Manufacturing Organizations	3 hr
<b>MFS 505</b>	Modeling of Manufacturing Processes and Machines	3 hr
<b>Manufacturing Specialization Electives</b>		6 hr
<b>Other Electives (appropriate courses in Engineering, Computer Science or Business &amp; Economics)</b>		6 hr
<b>Thesis</b>		
<b>Total</b>		24 hr

## II. Plan B (Non-thesis)

This option is reserved for students who have significant engineering research or development experience in a manufacturing environment, for which completion of a thesis would be less beneficial than the additional course work involved in Plan B. Approval of the student's advisor and of the DGS is necessary for a student to pursue Plan B.

The Plan B requires thirty (30) credit hours of course work which consists of the following (see [Course Descriptions](#)), excerpted from the University Bulletin\*\*. For a recommended sequence of courses for Plan B, see Appendix C.

<b>MFS 606</b>	Global Issues in Manufacturing	3 hr
<b>MFS 605</b>	Modeling Simulation and Control for Manufacturing	3 hr
<b>MFS 613</b>	Sustainability, Ethics and Leadership in Manufacturing Organizations	3 hr
<b>MFS 505</b>	Modeling of Manufacturing Processes and Machines	3 hr
<b>Manufacturing Specialization Electives</b>		9 hr
<b>Other Electives (appropriate courses in Engineering, Computer Science or Business &amp; Economics)</b>		9 hr
<b>Total</b>		30 hr

\*\* If you were admitted in the program in or before Spring 2016, refer to Appendix D for course work requirements and recommended sequence.

**For both Plan A and Plan B:** Per Graduate School requirements, one-half or more of the course work must be at the 600 level (graduate credit only) or above. At least 2/3 of course work must be in the MFS engineering program (MFS prefix courses). All students will be required to complete four specified core courses [MFS 505, MFS 605, MFS 606, MFS 613 (or MFS 611 if admitted in or before Spring 2016)]. MFS 606 should be taken in the first semester if possible. The electives for each student will be developed in conjunction with a faculty adviser to insure that the program provides breadth and depth of content for the student, and meets the specific needs and interests of the student. For students granted into Plan B, the final examination format will be determined by the advisor and the examination committee. For students admitted in or before Spring 2016 who are granted into Plan B, see appendix C for final examination format. For students admitted in the program in or before Spring 2016, the project class (MFS 784) must be conducted in consultation with the student's advisor. Students admitted in the program after Spring 2016 can still take the MFS 784 (project) course as one of the electives towards meeting the 30 credit hour requirement.

## III. Transfer of Credits

In some cases a student may transfer up to 9 semester hours credit from another program or university. Consult the Graduate School Bulletin for details.

#### **IV. Program Approval**

Each student's Plan of Study must be approved by both the faculty advisor and Director of Graduate Studies.

#### **V. Deficiencies**

A student may not be able to begin immediately a full graduate program leading to the MFS degree; it may be necessary for the student to satisfy prerequisites omitted in his/her undergraduate curriculum. Deficiencies are determined by the Director of Graduate Studies.

#### **VI. Requirements by Numbering**

A candidate for the MFS degree may credit the following toward degree requirements:

- Any 500-, 600-, or 700-level course; and
- Any 400G level course offered by a program other than Manufacturing System Engineering.

In addition, the following conditions apply:

- A minimum of half of the required credit hours must be 600- or 700- level courses (those meeting as organized classes). For Plan A this means 12 credit hours; for Plan B this requirement is 15 credit hours.
- At least two-thirds of the required credit hours must be in regular courses (excluding MFS 768, 780, 784).

### **B. Requirements by Major Area**

At least two-thirds of the course work must be in manufacturing-related areas. All courses must be included in the student's Plan of Study.

#### **I. Grades**

The MS 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.

#### **II. Transfer from Other Degree**

Students currently enrolled in other degree programs at the University may be transferred to the MFS program with the approval of the Director of Graduate Studies and the Dean of the Graduate School. All regulations and procedures stipulated herein shall be applied to such students.

#### **III. Thesis Requirements**

The thesis must be developed under the direction of a member or associate member of the Graduate Faculty. It must be approved by the thesis director (i.e. a faculty advisor), the Director of Graduate Studies, the examining 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." (see appendix)

#### IV. Final Examination

MS students will be eligible to sit for the Final Examination only if they have completed all coursework for the degree, or if any 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.

The student is required to take a final oral examination for the MFS degree regardless of the option. This examination is administered by an examining committee appointed by the Dean of the Graduate School upon recommendation by the Director of Graduate Studies. The committee must consist of at least three members of which the chairman is the student's faculty advisor. The Examination Committee must consist of:

- i. at least three (3) faculty members,
- ii. at least two (2), including the chair, must be full or associate Graduate Faculty members,
- iii. at least one (1) must be a full Graduate Faculty member,

The examination is comprehensive and covers the student's entire program including, but not limited to, the thesis.

The final examination is given no earlier than the beginning of the semester in which the degree is to be awarded and no later than eight days before the last day of classes of that semester. The examination must be declared either pass or failure on a majority basis. In the event of failure, the committee may recommend to the Graduate School the condition under which a second examination may be administered. In so far as it is practicable, the same examination committee gives this examination. A third examination is not permitted.

##### *Final Examination for Plan A Students*

The following procedures apply:

- i. Submit an "Application for Degree" to the Graduate School within 30 days of the beginning of the semester in which the student will take the examination.
- ii. Submit thesis to the thesis director and the Director of Graduate Studies in draft form.
- iii. Complete a Final Examination Recommendation Form (see appendix). This form, accompanied by a Thesis Approval form (see appendix), must be submitted to the Graduate School no later than 2 weeks prior to the anticipated date of the examination.
- iv. Submit thesis to the examining committee at least one week prior to the final examination.
- v. Take final examination.
- vi. Modify thesis as required by the examining committee.
- vii. Submit thesis in final form to the Graduate School (see calendar for exact date).



### ***Final Examination for Plan B Students***

The following procedures apply:

- i. Submit an "Application for Degree" to the Graduate School within 30 days of the beginning of the semester in which the student will take the examination.
- ii. Complete a Final Examination Recommendation Form (see [Appendix E](#)). This form must be submitted to The Graduate School no later than 2 weeks prior to the anticipated date of the examination.
- iii. If admitted to the program in or before Spring 2016, submit a written project report to examination committee at least one week prior to final examination. Requirements for students admitted in the program after Spring 2016 will depend on advisor and examination committee decides.
- iv. Take final examination.

### **V. Submission of Thesis**

After the final examination is passed, the final copy of the thesis, with 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 the responsibility of the student. One copy of the thesis must be filed with the Director of Graduate Studies.

### **VI. Graduation Fees**

There are no graduation fees for MS candidates. However if a thesis is being submitted, a fee for the binding of the thesis must be paid at the Student Billings and Collection Office when the thesis is submitted to the Graduate School.

### **VII. Residence Credits**

An MFS student who has completed the formal coursework and who is/is not receiving a graduate assistantship through the Department or University during Fall or Spring Term, with his/her time principally devoted to the MS MSE thesis, is required to register for MFS 748 (0 hours).

## **C. Operational Guidelines for Assistantships**

### **I. Period of Appointment**

The appointment period for Research Assistants is determined by the principal investigator or by the Director of the center as the case may be. With the exception of official University holidays, all graduate assistants are expected to provide service throughout the periods of their appointments. Absences during these periods require notification of and prior

approval by the faculty advisor. During periods when classes do not meet and during the summer (May 16-August 15), all assistants are expected to devote full-time to research.

## **II. Service Load**

- During the 9-month academic year, appointments are typically for one-half time service (twenty hours per week).
- Full-time appointments are typically made during the three summer months for students without summer courses.
- During the 9-month academic year, Assistants must be registered as full-time students. However, if the Assistant has completed all the course requirements for the degree, enrollment as a part-time student may be permitted with the approval of the Director of Graduate Studies.

## **III. Renewal and Termination of Appointments**

- All assistants shall maintain satisfactory academic records and progress toward degrees; their assistantships will not be renewed if their academic progress is unsatisfactory.
- Appointments are not renewed beyond the end of the academic term during which all degree requirements have been satisfied.
- Appointments are not renewed if the university requirements are not satisfied.
- Appointments are not renewed if funding is unavailable.

## **IV. Tuition Scholarships**

Nonresident graduate students holding research assistantships or fellowships may be eligible to receive tuition scholarships administered by the Graduate School and awarded each semester to cover the out-of-state portion of the tuition. The Director of Graduate Studies (DGS) is responsible for certifying to the Graduate School those eligible to receive tuition scholarships. Graduate students on traineeships or other externally funded programs where funds are available to pay tuition are not eligible for tuition scholarships.

Nonresident graduate students, **not** holding assistantships are also eligible for scholarships covering the out-of-state portion of the tuition. These “Kentucky Graduate Scholarships” are based on prior academic performance.

For more information, see the Graduate School homepage.

## **V. Health Care**

Graduate students with full assistantships or fellowships receive the student health insurance plan offered by the University of Kentucky. Other students are eligible to purchase this insurance.

For more information, see the Graduate School homepage.

## **VI. Income Tax Exemptions**

Assistantship stipends are subject to federal and state income taxes (note: unless covered by tax treaty) but exempt from Fayette County tax.

## **VII. Parking Privileges**

Graduate students are automatically eligible for 'C' parking permits. Application for 'E' permits by Teaching Assistants and Research Assistants shall be accepted only upon additional clarification of the DGS that the individual is employed in a service capacity and is required to meet a firm teaching or research schedule during normal class hours.

## **VIII. Social Security Taxes**

Graduate and Research Assistants holding either F-1 or J-1 visas are exempt from the payment of social security taxes. Others are similarly exempted only during those academic terms in which they are enrolled as full-time students.

## **IX. Holidays, Vacations and Sick Leave**

Graduate and research assistants are not required to work during official University holidays. However, since they 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 to their research projects.

## Appendix A

### Admission Criteria for Students without an Undergraduate Engineering Degree (preliminary)

Graduate Student Applicants without an ABET-accredited engineering degree must develop competence and demonstrate ability in the fundamentals of engineering. This is accomplished by completing, or having taken the equivalent of, a set of courses in one of the engineering disciplines. If appropriate, a number of courses drawn from two or more such disciplines could be considered. These courses can be taken in post-baccalaureate or undergraduate status. (NOTE: These courses may have prerequisites — see UK Bulletin)

Mechanical Engineering	
ME 151	Manufacturing Engineering
ME 220	Engineering Thermodynamics
ME 440	Controls
ME 330	Fluid Mechanics
ME 325	Heat Transfer
ME 344	Mechanical Design
Electrical Engineering	
EE 211	Circuits I
EE 221	Circuits II
EE 280	Design of Logic Circuits
EE 380	Computer Organization
EE 415	Electromechanics
EE 421	Signals & Systems I
EE 461	Intro. to Electronics
EE 468	Fields & Waves
Chemical Engineering	
CME 205	Process Principles I
CME 210	Process Principles II
CME 320	Engineering Thermodynamics
CS 221	Computer Science for Engineers
ME 330	Fluid Mechanics
CME 415	Separation Processes
CME 425	Heat & Mass Transfer
CME 420	Process Modeling
CME 550	Reactor Design

## Appendix B

### Recommended Sequence for Plan A (an example)

Since this is a graduate program, a semester by semester sequence cannot be completely defined. Some students will be part-time, and the sequence for full-time students may vary to some degree depending on their individual needs and prerequisites of courses. However, the sequence recommended for a full-time Plan A student would be as follows:

#### Semester 1

<b>MFS 606</b>	Global Issues In Manufacturing	3 hr
<b>MFS 613 *</b>	Sustainability, Ethics and Leadership in Manufacturing Organizations	3 hr
Manufacturing Specialization Elective 1		3 hr

\*MFS 611 may be considered for students admitted to the program in or before Spring 2016.

#### Semester 2

<b>MFS 505</b>	Modeling of Manufacturing Processes and Machines	3 hr
Manufacturing Specialization Elective 2		3 hr
Other Elective 1		3 hr

#### Semester 3

<b>MFS 605</b>	Modeling Simulation and Control for Manufacturing	3 hr
Other Elective 2		3 hr
Thesis		

Students working on their thesis, who have completed all required course work should register for MFS 748 (0 hours) to maintain their status in the university.

## Appendix C

### Recommended Sequence for Plan B (an example)

The coursework sequence consists of the following (see [Course Descriptions](#)), excerpted from the University Bulletin:

#### Semester 1

<b>MFS 606</b>	Global Issues in Manufacturing	3 hr
<b>MFS 613*</b>	Sustainability, Ethics and Leadership in Manufacturing Organizations	3 hr
	Manufacturing Specialization Elective 1	3 hr
	Other Elective 1	3 hr

#### Semester 2

<b>MFS 505</b>	Modeling of Manufacturing Processes and Machines	3 hr
	Manufacturing Specialization Elective 2	3 hr
	Other Elective 2	3 hr

#### Semester 3

<b>MFS 605</b>	Modeling Simulation and Control for Manufacturing	3 hr
	Manufacturing Specialization Elective 3	3 hr
	Other Elective 3	3 hr

## Appendix D

### *For Plan B Students Admitted in the Program in or before Spring 2016*

The Plan B requires thirty-three (33) credit hours of course work including a project, which consists of the following:

<b>MFS 606</b>	Global Issues in Manufacturing	3 hr
<b>MFS 605</b>	Modeling Simulation and Control for Manufacturing	3 hr
<b>MFS 613*</b>	Sustainability, Ethics, & Leadership in Manufacturing Organizations	3 hr
<b>MFS 505</b>	Modeling of Manufacturing Processes and Machines	3 hr
<b>Manufacturing Specialization Electives</b>		9 hr
<b>Other Electives (appropriate courses in Engineering, Computer Science or Business &amp; Economics)</b>		9 hr
<b>Project</b>		3 hr
<b>Total</b>		33 hr

### *Recommended Sequence for Plan B for Students Admitted in or before Spring 2016 (an example)*

The coursework sequence consists of the following (see [Course Descriptions](#)), excerpted from the University Bulletin:

#### Semester 1

<b>MFS 606</b>	Global Issues in Manufacturing	3 hr
<b>MFS 613*</b>	Sustainability, Ethics, & Leadership in Manufacturing Organizations	3 hr
Manufacturing Specialization Elective 1		3 hr
Other Elective 1		3 hr

\*or MFS 611 may be considered for students admitted in or before Spring 2016.

#### Semester 2

<b>MFS 505</b>	Modeling of Manufacturing Processes and Machines	3 hr
Manufacturing Specialization Elective 2		3 hr
Other Elective 2		3 hr

#### Semester 3

<b>MFS 605</b>	Modeling Simulation and Control for Manufacturing	3 hr
Manufacturing Specialization Elective 3		3 hr
Other Elective 3		3 hr
Project		3 hr

Students in Plan B will utilize their advisor's input and identify an area to demonstrate the application of concepts and tools learned through the Manufacturing Systems Engineering courses. The student will be responsible for documenting the project work in a report. The report will be similar in format to a thesis document but with an orientation towards the application and a smaller scope. The student will follow graduate school requirements for setting up a final exam committee. The student will share the report with the committee and then give an oral presentation on the project findings to the committee. The committee will evaluate the student's final presentation to ensure successful completion of the Plan B Master project.

## Appendix E

### Plan of Study MS in Manufacturing Systems Engineering University of Kentucky

<b>Name of Student:</b>		<b>Student ID No:</b>		
Date Submitted:		Date Degree Expected:		
General Field of Thesis/Project:				
Advisor:				
Research Topic:				
Core Courses				
Course No.	Course Title	Semester & Year	Grade	Credit Hours
MFS 505	Modeling of Manufacturing Processes and Machines			
MFS 605	Modeling Simulation and Control for Manufacturing			
MFS 606	Global Issues in Manufacturing			
MFS 613*	Sustainability Ethics and Leadership in Mfg. Org.			
Manufacturing Electives (2 Required for Thesis option, 3 Required for Project option)				
Course No.	Course Title	Semester & Year	Grade	Credit Hours
Other Electives (2 Required for Thesis option, 3 Required for Project option)				
Course No.	Course Title	Semester & Year	Grade	Credit Hours
<b>Total Credit Hours</b>				

*Plan A students must have at least 12 hours above 600 level. Plan B students must have at least 15 hours above the 600 level. Both Plan A and Plan B students can include up to 6 hours of MFS 780.*

_____	_____
Student Signature	Date
_____	_____
Advisor Signature	Date
_____	_____
Director of Graduate Studies Signature	Date

\*MFS 611, if admitted in or before Spring 2016



## **Appendix F**

### **Graduate Student Profile**

Form available at:

<http://www.engr.uky.edu/mfs/files/2014/08/MFS-GraduateStudentProfile.pdf>

### **Dual Degree Form**

This form is available at: <http://www.research.uky.edu/gs/Forms/JointDegreeMEMFE.pdf>

### **Transfer of Credit Form**

This is available at: <http://www.research.uky.edu/gs/Forms/TOCMastersSpecialist.pdf>

### **Instructions for the Preparation of Theses and Dissertations**

These guidelines are available in the Graduate School website at:

[http://www.gradschool.uky.edu/CurrentStudents/theses\\_prep.html](http://www.gradschool.uky.edu/CurrentStudents/theses_prep.html).

### **Request for Final Master's Degree Examination Form**

This form is available in the Graduate School website at:

[http://www.research.uky.edu/cfdocs/gs/MastersCommittee/Student/Selection\\_Screen.cfm](http://www.research.uky.edu/cfdocs/gs/MastersCommittee/Student/Selection_Screen.cfm).

### **Application for Degree**

To access this form, login to myUK: <https://myuk.uky.edu/irj/portal> and click on Student Services / myRecords / Graduate Degree Application.

### **Thesis Checklist**

This form is available at: <http://www.engr.uky.edu/mfs/files/2014/08/MSThesis-Checklist.pdf>

### **Non-thesis Checklist**

This form is available at: <http://www.engr.uky.edu/mfs/files/2014/08/MSNon-thesis-Checklist.pdf>