

Graduate Student Handbook

Materials Science and Engineering Program

M.S. and Ph.D. Degrees

College of Engineering and Applied Science
Department of Mechanical and Materials Engineering

University of Cincinnati
Cincinnati, Ohio, 45221

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I. PREFACE

A. Graduate School: Graduate Studies, Graduate Research and Faculty

The Dean of the Graduate School coordinates all graduate programs throughout the university. The Graduate School extends to its member students and faculty opportunities for advanced work in their chosen fields. The All-University Graduate Faculty has the responsibility for determining educational policies and for regulating the awarding of degrees. The Graduate Faculty formulates also common rules for instruction throughout the various departmental units and programs, including the manner of instruction and the methods for evaluating the results of examinations.

B. MSE Graduate Studies Director and Graduate Studies Committee

The Materials Science and Engineering (MSE) Program administers graduate programs leading to the M.S. and Ph.D. degrees. The MSE Graduate Studies Committee is the graduate policy body of the Materials Science and Engineering Program. Academic actions concerning the graduate program are made by this committee and administered by the Graduate Studies Director, in conformity with CEAS and Graduate College directives. The Graduate Studies Director is advisor to all MSE graduate students.

All forms and correspondence concerning the graduate program should be directed through the Graduate Program Office the Engineering College's Office of Graduate Studies (located in 665 Baldwin Hall).

C. Graduate Handbook.

The policies and procedures described in this Handbook apply equally to full-time and part-time students pursuing a graduate degree in the MSE program. These policies supplement those published in the University of Cincinnati Handbook by the Division of Graduate Education and Research of the University, and other regulations set forth by the Engineering College, and the International Student Services Office. Students are advised to be thoroughly familiar with, and conform to, all these rules and regulations.

II. ADMISSION TO GRADUATE DEGREE PROGRAMS

A. Application

To gain admission to graduate study in the Materials Science and Engineering Program, the student must submit an application form, which is available online at the Engineering College's Office of Graduate Studies site.

The application should include three letters of recommendation and transcripts of his/her undergraduate and graduate record (if applicable). The GRE (Graduate Record Examination) is required for those students who received their last degree from a non-US University. It is recommended that students from U.S. Universities also submit GRE results. On receipt of the application, the Graduate Studies Committee will determine if the student is to be admitted for graduate study in the MSE Program and whether he/she is eligible for financial aid. Additional information relating to admissions is also available from the above units, together with details of the MSE Program, faculty and research areas.

B. Financial Aid.

Financial aid usually takes the form of a University Graduate Scholarship (UGS) (a Tuition Scholarship. A Graduate Teaching Assistantship (UGA) (which carries a stipend) may also be offered to select incoming graduate students. In some cases, the student might be admitted with aid in the form of a Research Assistantship (RA) or a Research Fellowship and a UGS. In a few other cases, a student could also be admitted without program financial aid.

A Student, who has explicitly declined to seek financial aid at the time of application for admission, may not later reverse that decision and seek such aid, unless at least one year has elapsed from the time of initial enrollment into the graduate program. Exception to this rule may be granted only upon petition to the Director of Graduate Studies and by presenting evidence of hardship, or other extenuating circumstances that necessitate such a reversal.

UGS may be applied for by M.S. and PhD students under the following criteria:

- M.S. students may apply for up to 4 semesters (Fall and Spring semesters) total, with the fourth semester not guaranteed unless they are receiving a Research Assistantship (RA), Graduate Assistantship (GA), or Teaching Assistantship (TA).
- PhD students may apply if they have had less than a total of 4 years of UGS support unless they are receiving a Research Assistantship (RA), Graduate Assistantship (GA), or Teaching Assistantship (TA).
- **All students receiving RA, GA, or TA funds must be registered full time, and will be awarded UGS support.**
- If RA, GA, or TA funding is secured and a full time course load is not scheduled, the awardee will be subject to repay awarded funds.
- Students are not required to schedule for summer credit hours to maintain financial eligibility throughout the rest of the year.
- A signed Program of Study form must be turned in to the Office of Graduate Studies (Baldwin Hall 665, front desk) along with completion of the online application and submission of a printout of the completed online application to the Office of Graduate Studies (Baldwin Hall 665, front desk).

UGS application starts online at, <http://www.eng.uc.edu/UGSApplication/>

A student, who has been placed on probation for 2 consecutive semesters or any two semesters during their tenure as a graduate student will not be recommended for further financial aid (consult the 'Graduate Student's Responsibilities' document for details about probation).

III. GRADUATE CREDITS AND GRADES.

A. Course Registration

Students who have been admitted to graduate study in the MSE program, should, upon arrival, confer with the Graduate Studies Director, who initially will act as the student's advisor, until the Thesis or Dissertation Advisor is chosen. Once an academic advisor is chosen, all courses taken subsequently by the student must have the prior approval of that advisor. All MSE graduate students are expected to take mainly those courses, classes, and other credits hours that are offered within the Program, and/or those approved by the Program. A list of approved courses will be available in the Graduate Program office. Exceptions to this requirement must be approved, in writing, by the student's advisor and the Graduate Studies Director. Students wishing to take classes outside of the College of Engineering must fill out a form available in the

Graduate Studies Office and obtain approval also from the Program Director.

All Full-time MSE graduate students are required to submit a copy of their complete Program of Study (from UC Registrar's Office) to their advisor before the end of the fourth week of the semester when starting a M.S. or PhD degree. Changes may be made by resubmitting a modified, signed Program of Study form to the graduate. A copy of this schedule should be submitted also to the MSE Graduate Program Office for their records

B. Selection of Advisor.

Students admitted to the MSE Program should make every effort to choose a thesis (research) advisor during the first semester of their enrollment in the Program. A student entering the program with GA-UGS support or UGS-only support should, before choosing his/her thesis or advisor, contact faculty members of the Program to determine an area of mutual research interest. The selection of the research advisor is the most important decision the student will make in the early stages of their career study. This selection should be made in writing using the appropriate form (signed by the student and the faculty advisor), and approved by the Graduate Studies Director, with notification to the Graduate Program Office.

If the research advisor is not a *primary* MSE faculty member, the student must still have a *primary* MSE faculty member as the academic advisor. In this case, the student would still perform research for their research advisor. Furthermore, the *primary* MSE faculty member would assist in organizing the student's dissertation committee. Both may assist in organizing the student's progress review and act as dissertation advisor. The advisor(s) will advise the student on all phases of the progress towards the degree objective, including their academic program and the thesis or dissertation research project, which is carried out under close guidance by the research advisor. The student should, therefore, keep their advisor(s) informed at all times of their academic progress, courses taken, grades received, examinations passed, etc. The award of financial support beyond the first year invariably will depend on the academic performance of the student, as well as on the availability of financial resources. The Director of Graduate Studies must be advised of this support in writing (in a form signed by both the student and the faculty advisor providing the support). See section VI – E for more details.

C. Full-time Load and Reduced-Time Load of Graduate Credits.

The normal load for a student devoting full-time to graduate study is 15 graduate credits of work in the fall and spring semesters. Students will not be permitted to register for more than 18 credits in any one semester without approval of their advisor and the Director of Graduate Studies. Students who have completed their total credit hour requirements for the degree being pursued, but have not yet completed and defended their thesis/dissertation, may register for a reduced course load of 1 credit hour per semester (maintaining thereby their full-time status) by filling out a form available online and/or in the College's Graduate Studies Office and having their advisor sign it. Students are encouraged to sign up for seminar to fulfill this 1 credit hour criteria. Since these policies may be subject to revision, students should contact the Graduate Program Office periodically for guidance.

D. Auditing

Graduate students, with the permission of the course instructor and his/her advisor, may be allowed to audit a course. The instructor may require the student to take all the regular examinations of the course. If the examinations grades are unsatisfactory, the student may be required to drop the course. The student is normally assigned a "T" grade for successfully auditing a class. However, these credits cannot be included as part of the degree course requirements.

E. Special Projects

Of the research credits required to satisfy graduate degree requirements, no more than 4 semester credit hours may be taken as special project credits by M.S. students. Likewise, not more than 6 credit hours may be taken as special project, by the PhD. student (after the M.S. degree). The student will receive the letter grades in the special projects. These credits cannot be used to satisfy the graduate degree course requirements.

F. Unsatisfactory Course Performance.

A student having a grade of "F", "I", or, "NG" or "UP" in any course for which he/she has registered is not considered to have completed the degree requirements. An "F" grade is permanent on the student's transcript and is included in the GPA. The student cannot graduate without retaking the course with the "F" grade and obtaining a Pass (A, B, C, etc) grade. In unusual cases, an alternative procedure may be permitted, provided that such procedure has the approval of the course instructor and the advisor.

No course may be dropped unless permission is obtained from the course instructor and the advisor.

G. Minimum Academic Performance.

The student must maintain at least a 3.0 cumulative quality point average (QPA) in graduate courses at the University of Cincinnati and within the Graduate Program. Failure to maintain at least a 3.0 QPA may result in probation in the following semester (consult the 'Graduate Student's Responsibilities', for details about probation).

No student with a QPA below 3.0 will be recommended for graduation.

H. Transfer of Credits.

To transfer graduate credits earned at other U.S. institutions of higher learning, the student must file a petition for Advanced Standing with the Director of Graduate Studies not later than two semesters after admission. The petition should be endorsed by the student's advisor, and should list the courses to be transferred, the university, the year, and the grade earned. The student should provide proof that the course to be transferred was not part of a program for which a degree was granted. Only courses with grades "A" or "B", taken within the last 5 years, can be transferred. Credit for a course will be transferred only if an equivalent course is given at the University of Cincinnati and the student has not taken the UC course, and if the equivalent course is not one of the first level or advanced level core courses offered by the program. A maximum of 6 semester credits may be transferred to satisfy either the M.S. or Ph.D. course requirements.

I. Undergraduate Courses for Graduate Credits

Under special circumstances, undergraduate courses offered by other Departments within the University may be counted toward the requirements for the M.S. or Ph.D. degree. A petition must be filed by the student, with the endorsement of his/her advisor, to the Director of Graduate Studies. The undergraduate course in question must be: (1) outside the student's main area of study, (2) essential in broadening the student's capability in an area related to his/her main area of study, and (3) unavailable at the graduate level within the University. No more than six credit hours taken under this provision may be counted toward the degree requirement.

IV. DEGREE PROGRAMS AND COURSE REQUIREMENTS

A. Degrees Offered

The MSE graduate Program offers both MS level and PhD level degrees in Materials Science and Engineering, based on core level and recommended/optional course requirements, and a thesis presentation and defense. The Program is generally structured towards specialization in Metals, Ceramics, or Polymers, as sub-disciplines, with Composites as possible special area. A non-thesis (MEng) option may be available at the MS level to students who do not receive financial aid, to part-time students with external sponsorship, or under exceptional circumstances with approval of the Graduate Dean and Graduate Studies Director.

MEng

The MSE department offers an MEng program option. 4-5 Track Courses are required along with 1-3 Elective Courses along with the 2 MEng specific Core Courses. Track and elective courses may be picked from the course listings under the MSE section of the MEng Handbook. Generally a capstone project is required and may be registered during the Spring semester after first entering the program. Students may complete the capstone over the following Fall semester if it is not completed during Spring semester. Please refer to the MEng Handbook for a detailed description of program requirements and courses available.

<http://www.min.uc.edu/me/mse/graduate-students>

B. Core Courses

All graduate students entering the MSE graduate program are required to take the following core courses. Four of the listed courses in the chosen option must be taken by MS students for a total of 12 credit hours. Seven of the listed courses in the chosen option should be taken by PhD students for a total of 21 credit hours.

A Total of 4 Core Courses for all MS and PhD Students from the List Below:

1. One of the following two courses is required:
MTEN6001 – Principles of Materials
MTEN7094 – Fundamentals of Polymer Science
2. One of the following two courses is required:
MTEN6005 – Materials Thermodynamics
MTEN7035 – Advanced Thermodynamics

3. One of the following two courses is required:
MTEN7010C – Materials Characterization
MTEN7032C – Polymer Analysis and Characterization

4. One of the following two courses is required:
MTEN6020 – Materials Kinetics
MTEN6034 – Physics of Polymer Properties

A Total of 7 Core Courses for Ph.D. Students including 3 Additional Core Courses below
Any 3 courses from the following list are required

MTEN6070 – Phase Transformations
MTEN6097 – Mechanical Behavior of Materials
MTEN7048 – Crystallography and Diffraction
MTEN6025C – Polymer Processing
MTEN6053 – Ceramic Materials Chemistry and Synthesis
MTEN6042 – Composite Materials
MTEN8000 – Solidification Processing of Materials

V. MS Course Credit Requirements

To satisfy the requirements for the MS degree, a minimum of 30 graduate semester credit hours must be completed by the student. Of these 30, a minimum of 21 course work credit hours should be in graduate courses offered through the Program. Of the 20 course work credit hours, 12 credits must come from core courses (see IV – B) depending on the academic route chosen (polymers or metals/ceramics). Students wishing to take courses offered by other Departments/Programs, to fulfill any remaining course work credit hour balance must obtain prior approval from their advisor and the Graduate Studies Director. These courses must be related to MSE program goals, and be in an area that will advance the student's thesis research. Of the required total of 30 credit hours, 9 credit hours must be in M.S. thesis research. All courses require approval by the student's thesis advisor.

Candidacy:

Enrollment in the graduate program makes the student a **candidate** for the degree of Master of Science.

Time Limitations:

M.S. students are expected to complete the degree requirements within (6) semesters (2 years) after initial enrollment into the graduate program. Financial aid may be withheld after this time limit.

MS Theses, and Examinations

The selection of the MS thesis topic is made in consultation with the student's thesis advisor. On completion of the thesis work, the student in consultation with his/her thesis advisor, will select the names of two faculty members, who together with the advisor will form the thesis examination committee. A majority of the committee must also be from the program faculty, unless specially exempted by the Graduate Studies Director. The thesis committee selection must be submitted to the Graduate Studies Director for approval [use appropriate form], prior to published notifications or the scheduling of the thesis examination. Upon review, the Graduate Studies Committee may add up to two additional members to the thesis committee. Approval of the thesis examination results will be conditioned on this prior procedure being adhered to.

A thesis must be prepared in accordance with the guidelines (see "Instructions for the Preparation and Depositing of Master's Theses and Doctoral Dissertations" of the Graduate College). A

successful oral defense of the thesis before the student's committee is a degree requirement. Copies of the thesis must be submitted to the Thesis Committee members at least one week prior to the oral defense. The oral examination will start with a formal presentation (20-30 minutes) by the student, followed by questions from the members of the thesis committee and members of the audience. The entire examination may not exceed 2 hours. At its completion, both the student and audience will be excused from the room, and the thesis committee will deliberate as to the merits of both the written thesis and the oral defense. The results of this deliberation will initially be communicated directly to the student by the committee, and subsequently in written form by the advisor, with copies to the Graduate Program Director and Graduate Studies Office. Required revisions to the thesis should be conveyed to the student in writing [use appropriate thesis examination form]. The student's advisor will suggest the final grade for research, which must be approved by the committee. The committee will also determine, based on the performance at the oral defense, whether the student will be recommended to proceed towards the PhD degree. The Committee may also recommend a date (not to exceed six months from the date of defense) for the submission of the final copies of the thesis. All recommendations from the thesis committee should be conveyed to the Graduate Director in writing (use relevant form) by the advisor within a time period of 1 week from the date of the defense. The thesis advisor must assure that the student makes the recommended changes to the thesis before the final copies are submitted. The student should make the required changes and submit the final thesis within a reasonable period of time. The committee's recommendation, for continuation to the PhD degree, may be voided by the Graduate Studies Director, in cases where the student has unreasonably delayed his/her MS graduation after the thesis defense.

VI. DOCTORAL DEGREE PROGRAM

A. Enrollment.

The Department offers programs in metals, ceramics, and polymers leading to the Ph.D. degree. There are three routes by which a student can enroll in the Ph.D. program.

1. Students with M.S. (MSE) from UC:

A student having a M.S. degree with major in Materials Science or Materials Engineering from the University of Cincinnati must secure a recommendation from his/her thesis Committee to proceed towards the PhD

2. Direct PhD Program After BS:

A student already in the MS program may request direct transfer to the PhD program (use relevant form) at the end of the second semester after enrollment if he/she has obtained a minimum of 27 graduate course credit hours (not including special projects) and GPA of 3.5 or better in the core courses as well as in the overall graduate courses. To proceed under this program, the student is required to pass the graduate qualifying examination within two semesters after selecting this option. If the student fails the qualifying examination in his/her first attempt, he/she will be required to take the MS degree route first and will then pursue the same route available to other students. However, if the student is allowed to continue for a PhD after completing the M.S. degree, he/she will have only one more chance to take the qualifying examination. Application for the direct PhD program must be made before the end of the second academic year (use relevant form) if the student passes the PhD qualifying exam on the first attempt.

3. Students with MENG from UC and/or MS from Other Departments or Universities:

A student having an MS degree in an appropriate field from a recognized university may be admitted to the PhD program in Materials upon application approval by the Graduate Studies Committee.

Students having an MENG degree from the College will be admitted to the PhD program only after specific review and approval by the Graduate Studies Committee, since the MENG is intended to be terminal degree.

B. Credit Hours.

Students pursuing the PhD program are required to take 30 credit hours in course work and 60 credit hours in research. Of the 30 course credit hours, 15 must be from a core course (see IV – B) depending on the academic route chosen (polymers or metals/ceramics). Another 9 must be from courses within the MSE department, with the remaining 6 from approved courses (these can be from the MSE department, fill out a program of study found in the Office of Graduate Studies or online at: http://ceas.uc.edu/Graduate_Studies/CurrentStudents/GraduateSchoolForms.html under General Forms).

Register for seminar

1. Students with B.S. Under Direct Ph.D. Program:

The doctoral degree requires a minimum of three years of full-time graduate study in the MSE program and a minimum of 90 graduate semester credits beyond the bachelor's degree, excluding credits earned to remove deficiencies. Of the required total of 90 credit hours, a minimum of 30 credit hours must be in coursework and a minimum of 60 credit hours must be in research. Of the total 30 credit hours of course work required, a minimum of 24 credit hours (including 18 credit hours of core courses described in section IV - B must be in graduate courses offered or approved by the Program. The remaining 6 credit hours must be in graduate courses approved by the student's advisor. All course registrations should have prior approval by the student's dissertation advisor.

2. Students with MS /MENG from UC in MSE or Other Departments or Other Universities:

For students entering this Department with an approved M.S. degree from UC (in MSE or another Department) or another University, the doctoral degree in the MSE program requires a minimum of three years of full-time graduate study and completion of a minimum of 60 credit hours, excluding credits earned to remove deficiencies. Of the total of 60 credit hours, the student must complete a minimum of 30 credit hours in courses and a minimum of 30 credit hours in research. Of the required 30 credit hours of course work, a minimum of 24 credit hours must be in Departmental graduate courses or those approved by the Program, including 15 credit hours of core courses described in Section IV – B. All course registrations should be approved by the student's Dissertation Advisor.

3. Department Seminar

All students are required to sign-up for 1 credit hour of seminar in the Fall and Spring semesters of each academic year. M.S. students are only required to register for the first 4 semesters of their degree. PhD students are only required to register for the first 6 semesters of their degree. However, students are encouraged to continue attending seminar even after completing these requirements. Attendance is mandatory and required for a PASS grade. If a student is unable

to attend the seminar during a given week, prior written approval must be obtained from the student's advisor and the faculty seminar coordinator. This 1 credit hour seminar may be used to fill the requirement for reduced course load after ALL other credit hour requirements are met (course work and research). See section III – C for more details on reduced course loads.

C. Qualifying Examination.

1. Philosophy:

The objective of the Ph.D. Qualifying examination is to determine whether the student's level of preparation in his/her chosen main field (metals/ceramics or polymers) within the general field of MSE, is adequate for the successful conduct of the doctoral dissertation research program. The examination is structured to assess both the student's depth of knowledge in the chosen field and his/her ability to apply this knowledge during the *oral examination* of the student's written *research proposal* based off of the student's research. The Qualifying Examination consists, therefore, of a written examination consisting of sets of questions in four topic areas coinciding with the four required core classes. Students taking the exam will convey which of the two classes in each category they intend to include in their exam to the chair of the qualifier committee (the program chair), and may take an exam on a course they did not formally take for credit, though they are discouraged to do so.

Prior to the *oral exam* date, the student will prepare the written *research proposal* in consultation with his/her research advisor. Written and electronic copies of the *research proposal* must be submitted each member of the *oral exam* committee a minimum of two weeks prior to the oral examination.

2. Time Limitations:

A full-time student who started in this Program with a B.S. degree should make the first attempt at the qualifying examination no later than the 7th semester from the initial enrollment. A student who started with an M.S. degree should make the first attempt no later than the 4th semester from the initial enrollment. For those students who are unable to take the qualifier within the scheduled time period, special permission is required by the graduate director for delay. This can be done by students submitting a request with needed reasons, certificates, and approval from their supervisors. A student may choose to take the qualifying examination prior to the above time limits by informing (in writing) the Graduate Director. By the first day of class of the Autumn and Spring semesters, those students planning to take the Ph.D. qualifying examination during that period must declare, in writing, (use relevant form) their chosen field (ceramics/metals or polymers) for the examination.

3. Examination Procedure:

The following procedures will be used for conducting the Ph.D. Qualifying Examination:

- a. The Graduate Director will assume the position of the Qualifying Examination Chair.
- b. By the second week of the semester The Graduate Program Director will prepare a list of all candidates scheduled to appear for the PhD qualifying examination. The Qualifying Examination Chair will consult with students to determine the individual student's examination topic areas and prepare the overall examination schedule. The Oral Part should be taken within the following academic semester. The entire qualifier should be completed within one academic year. Every attempt will be made to conduct the examinations on the published schedule. Under exceptional circumstances, the Chair has the option of rescheduling the examination.

c. The individual student's examination committee for the Written Part will consist of The Chair and three *primary* faculty members. Each member of the panel will develop a set questions in their assigned topic area for the qualifying exam. The *Oral Exam* will be chaired by the student's dissertation advisor and will include at least two other *primary* MSE faculty members.

d. The Written Part of the exam is based upon 400 total points (100 points from each topical area, for instance Physical Metallurgy). The Written Part is open book. A minimum average percentage of 60 % overall is required for a passing grade. The Written Part is given in a predesignated location and proctored by the Qualifying Exam Committee Chair.

Detailed written exam procedures and subtopics can be found at:

<https://ceas.uc.edu/academics/departments/mechanical-materials-engineering/materials-science-and-engineering/graduate-student-info.html>

Students who fail the Written Part are required to retake the Written Part during the next offered exam. **A maximum of two times** to take the Written Part is allowed. Anonymities of students and their supervisors are kept for the entire qualifying exam (including grading). Therefore, students only provide their assigned Qualifying Exam Number on the test.

e. The oral part of the exam is to be given by the Ph. D Qualifying Oral Exam Committee. The Oral Exam Committee is chaired and organized by the student's dissertation advisor. It is recommended that the Oral Exam Committee becomes the Dissertation Committee upon student passing the qualifier. The Committee should include at least two other *primary* MSE faculty members along with the dissertation advisor. The student submits a written report, called: *Research Proposal* based on his/her proposed research topic with a 15-page limit, excluding references. The Research Proposal consists 4 parts: Introduction, Literature Review, Background/Motivation, and Proposed Research. The report must be submitted to all committee members two weeks prior to the *Oral Exam* in both electronic and printed forms. The format of the *Research Proposal* should follow that of *Advanced Materials*.

f. The Oral Part is limited to 2 hour maximum. The formal presentation of the *Research Proposal* during the Oral Part is limited to the first 40 minutes (uninterrupted, except for brief clarifications) of the examination. The use of viewgraphs, power point or other visual aids, is recommended. The student must prepare a high quality professional/technical presentation. The remaining time is reserved for Oral Exam Committee members to ask questions related to the literature review and critique the student's experimental results and analysis.

Students who fail the Oral Part are required to reschedule the Oral Part with their Committee by the following semester. **A maximum of two times** to take the Oral Part is allowed.

4. Pass/Fail Policy:

a. A Pass for the Written Part is awarded if at least a 60 % average overall is earned. The written part is a total of 6 hours. Typically, 10 am - 4 pm. Contact the Graduate Chair if conflicts arise, prior to taking the written part. Notify your research advisor and the Graduate Chair BEFORE the semester starts in which you are planning to take the qualifier.

b. The Oral Part is graded as a Pass/Fail as determined by the Oral Exam Committee (the Oral Exam Committee is composed of the student's research advisor and at least two other primary MSE faculty). Notify your research advisor and the Graduate Chair BEFORE the semester starts in which you are planning to take the qualifier

D. Doctoral Candidacy.

A student will be recommended for admission to Doctoral candidacy upon completion of the following requirements:

1. Completion of all course requirements (including the Ph.D. core classes)
2. Passing of the qualifying examination.
3. Passing the Oral English Proficiency Test (applicable to only those students whose native language is not English).
4. Approval of the student's dissertation examination (advisory) committee (see below). At the appropriate time (not more than one academic year after passing the qualifying examination), the student may initiate the application for candidacy process (use relevant form) starting with the Graduate Director. At least six months must elapse between the time of admission to doctoral candidacy and the dissertation defense examination. A student who has been admitted to candidacy will normally devote all his/her efforts toward research leading to the PhD degree.

E. Dissertation.

1. Dissertation Advisor:

The student should make every effort to select his/her Dissertation Advisor by the end of the first semester after enrollment into the Ph.D. program. This decision should not be postponed beyond the end of the second semester. It is strongly recommended that the student spend time with each faculty member discussing that faculty member's research interests. After talking to all faculty members, the student will be in a better position to make a decision regarding his/her selection of an advisor. The decision must be mutually agreeable between student and faculty member, and should be communicated to the Director of Graduate Studies, in writing, by both parties (use appropriate form), detailing the financial support level that will be provided by the advisor.

2. Dissertation Examination (Advisory) Committee

The student will select a dissertation topic in consultation with the advisor, and together they will also select a list of members to be appointed to the student's Dissertation Examination (Advisory) Committee. Such a list should include the student's dissertation advisor and at least three additional faculty members. The majority of the committee members must be from the faculty of the Program. The student will then submit the list (use relevant form), together with a short abstract (less than 400 words) of the proposed research, to the Director of Graduate Studies for approval. This procedure must precede any examinations being scheduled. The latter will ensure that the committee members' expertise covers the student's research areas adequately. The Graduate Studies Director and Graduate Committee may appoint up to two additional members to the Dissertation Examination Committee.

3. Oral Progress Review:

The primary objective of the progress review is to assure that the graduate student is making adequate progress towards the PhD degree, specifically in the quality and quantity of research work. The student will present the work in a coherent, meaningful way to the Dissertation Examination Committee. These reviews are designed to facilitate evaluation of the student's

progress towards the stated degree objective, by both the advisor and the Program's Graduate Studies Committee. During these reviews, the Dissertation Examination Committee is expected to critically review of the student's progress and make recommendations that will guide the student's progress towards completion of the degree, and assure that the research meets the expected high standards of the doctoral program. The following procedures should be used:

The student is encouraged to complete the first dissertation research progress review as early as possible, but no later than two years after passing the PhD qualifying examination. The student should initiate the process by submitting the Dissertation Progress Report Request application (use relevant form) to the Graduate Studies Director.

The review process will consist of two components, namely, the Written Part and the Oral Part. For the Written Part, the student is expected to submit a written report (not to exceed 35 pages, double-spaced) to the Dissertation Examination Committee at least two weeks prior to the proposed review date. The written report must include: (i) Background/Introduction, (ii) Statement of Objectives and Scope of the work, (iii) Summary of work done and, (iv) a time-line for completion of Ph.D. degree. Appropriate figures, tables, micrographs, references, etc., must also be included.

For the Oral Part, the student is required to make a 30-40 minute presentation in front of all the Dissertation Examination Committee members, at the scheduled date and time. Based on the written report and the presented material, the committee will conduct a questions and answers dialogue with the on the significance of the research findings, and on the overall merit and direction of the research. The oral review process is not expected to exceed two hours, and at the end, the student will be excused from the room for the committee deliberations. Following such deliberations, the student is brought into the review room and advised [used relevant examination form], by the entire committee of the steps needed to facilitate successful completion of the thesis work. Subsequently, the advisor will communicate these recommendations in writing to the student, according to the procedures described below.

Based on the review, the Dissertation Examination Committee (through the student's advisor) will make two sets of recommendations to the student in writing, one on the content, quality, and the rate of progress of the dissertation research, and the other on the need for additional research reviews. First, the committee may provide directions to conduct additional research work and/or analysis, modeling, etc., that is deemed essential to completing the work. If warranted, the committee could also make specific recommendations as to the scope, direction and feasibility of the research project. The committee could also express concern over the rate of progress. Second, the committee may require that the student appear for additional reviews before the final dissertation defense. Such additional reviews should be done only after adequate time has been given to the student to make sufficient progress, usually not less than six months. Both these sets of recommendations should be communicated to the student in writing by the student's advisor within two weeks after the review, with copies sent to the members of the Dissertation Examination Committee and to the Graduate Studies Director [use appropriate examination form].

4. Doctoral Research and Preparation of Dissertation:

The doctoral research work of a student must be independent and original, leading to at least one refereed publication in a reputed journal with the student as the first author. The dissertation itself is a stand-alone, coherent document that reflects the highest quality that the MSE Program at UC strives to maintain. This document is archived by the UC Libraries and by the international professional community through the services of the "Dissertation Abstracts".

5. Final Defense of Dissertation:

The student should initiate the process by submitting the Dissertation Defense application (use relevant form) to the Graduate Director.

Prior to the public defense, copies of the dissertation for review by the Advisory Committee members must be submitted to the Departmental office two weeks before the scheduled defense date. The dissertation must be accompanied by a reprint of a publication, in a refereed journal, that has resulted from the dissertation research, or a manuscript that is ready to be submitted to a refereed journal.

The student will defend his/her dissertation in public, according to the procedures outlined in the University Graduate Handbook of the Graduate College. The defense must be scheduled no later than four weeks before the end of the semester in which the degree is expected. The Graduate Program Office will initiate the Ph.D. Dissertation Defense Approval form for the thesis advisory committee approval. A final copy of the dissertation, incorporating all recommended revisions, must be approved by the thesis advisor before the student can be certified (use relevant form) for graduation. In exceptional cases, the Graduate Studies Committee or Program head, may require additional revisions to the dissertation. One copy of the final document must be deposited with the program for archival purposes.

VI. SPECIAL RULES AND PROVISIONS

A. Graduate Student Responsibilities.

The graduate student is responsible for monitoring progress toward the advanced degree by meeting the deadlines for specific events such as selecting the advisor, taking the qualifying examination, completing course requirements, etc. A checklist will be reviewed by the Director of Graduate Studies periodically, and the student will be notified in writing about his/her progress towards the degree. If the student is found to be in violation of any of the regulations (such as failing to maintain a "B" average in courses, failing to meet the appropriate deadlines, etc.), he/she may be recommended for probation for that academic semester. If a student is on probation for two consecutive semesters or three non-consecutive semesters, he/she may be denied further financial aid and dismissed from the program.

B. Course Deficiencies.

A new graduate student who is deficient in undergraduate studies may be required by his/her advisor to take certain undergraduate courses to make up such deficiencies. Graduate credit, however, will not be granted for these courses, unless they are listed as equivalent courses offered by the University. All students who enter the Graduate program with Materials Science and Engineering as their major subject must be familiar with the fundamental principles and laboratory techniques that are characteristic of this discipline. Usually, the students with deficiencies in undergraduate studies will not receive a graduate teaching assistantship (UGA) from the Department.

C. Graduate Committees.

The various committees, for the MS thesis defense, PhD dissertation research progress report, and PhD dissertation defense, must be formally appointed by the Graduate Director with approval from the Graduate Studies Committee. The request for appointment of a thesis committee must be initiated by the graduate student, with the approval of his/her thesis advisor.

Time Constraints for Submission of Written Documents

The students must submit the various written documents to the appropriate committees at least 10 days prior to the date of deliberation by the committee. Such written documents include the MS thesis, literature review report for PhD qualifying examination, PhD progress report, and PhD dissertation.

D. Changing Advisor.

It is recognized that occasionally, a student may have to change his/her academic advisor during the course of his/her tenure in the graduate program. Normally, such a change should be driven by academic considerations but, in any event, an approval form must be processed through the Graduate Studies Director and Graduate Program Office, before the student can officially change his/her advisor. Approval and agreement by all parties to this change should indicate that all research obligations to the current advisor have been met a pre-condition for the student to be allowed to change advisor.

E. Advisors from Other Departments.

A student enrolled in the Program of Materials Science and Engineering may sometimes need to have an advisor from another department in the College or University, because of the interdisciplinary nature of the program he/she may plan to pursue. Approval may be requested from the Director of Graduate Studies. A condition for approval is that the student must also have a program advisor who will guide his/her academic progress within the program. A graduate student may not choose an outside advisor in the first year if he/she is receiving an MSE Program GA that year. The outside advisor may not advise more than two MSE graduate students at any given time. A graduate student who was admitted and has received financial aid from the MSE program is considered a graduate student of the Program and must abide by the prevailing graduate regulations, even when the research advisor is from another department.

F. Maximum Number of Credit Hours.

The University has set an upper limit for the number of credit hours that a graduate student can earn and still be eligible for financial aid (UGS, GA, etc.). For students who start in the graduate program at the University of Cincinnati after a BS degree this upper limit is 174 graduate semester credit hours. For students starting after an M.S. degree from another institution this upper limit is 134 graduate credit hours. For students transferring from another department within the University of Cincinnati, graduate credits earned in different departments are counted cumulatively in determining whether the above stated upper limit has been reached.

G. Certification for Graduation.

The Graduate Director has the responsibility for certifying students for award of the MS and PhD degrees. At the time of certification, the entire academic file is reviewed to assure compliance with all the academic requirements for graduation. It is the student's responsibility to make sure that he/she is in compliance with all the academic requirements. A student is expected to graduate within 12 months of the date of his/her thesis/dissertation defense. Any extension of this limit must be approved by the entire thesis/dissertation Examination Committee. Failure to comply with this time limit may result also in non-certification for graduation. Under these conditions, the Graduate Studies Director may recommend that an MS student be not allowed to continue in the PhD program, and that a PhD student be asked to again defend his/her dissertation.

H. Part-time Students.

All provisions stated in this Handbook are applicable to part-time students as well as to full-time students. However, part-time students are not subject to the time limitations set for Ph.D. qualifying examination and for dissertation research progress oral review. They are subject, however, to other time limits set by the University Graduate Handbook. A change in the status of a student from full-time to part-time or vice versa will require approval by the student's advisor and the Director of Graduate Studies.

I. Conflict and Grievance Resolution.

Students who have a conflict with their advisor, course instructor, staff member or other students should bring the issue to the attention of the Graduate Studies Director, who will initiate the necessary ameliorative steps. If this route is not available, the student may make an appeal directly to the Program Head.

J. Degree Progress Review.

The MSE Graduate Program Office will maintain all records to monitor the progress of graduate students. Degree Progress Audit (DPA) forms summarizing the student's progress towards the stated degree objective will be made available to the advisor, periodically. The student is ultimately responsible to be thoroughly familiar with and comply with the Program, College, and University graduate regulations.

The MSE Graduate Studies Office will maintain all records appropriate for monitoring the progress of graduate students towards their degree objectives. Degree Progress Audit (DPA) forms summarizing the student's progress towards the stated degree objective will be made available to the advisor, periodically. The student must be familiar with these procedures, and is responsible for complying with all Program, College, and University graduate regulations.

GRADUATE PROGRAM IN MATERIALS SCIENCE AND ENGINEERING
DEPARTMENT OF MECHANICAL AND MATERIALS ENGINEERING,

APPENDIX Projected Time Schedule for Completion of Degree Requirements

<u>1. Starting with BS Degree</u>	<u>Deadline</u>
Selection of Thesis Advisor	2 semesters from enrollment
Satisfactory completion of 12 credits of core courses	3 semesters from enrollment
Satisfactory completion of 30 graduate course credits	4 semesters from enrollment
MS Degree	6 semesters from enrollment
Satisfactory completion of PhD Qualifying Examination	7 semesters from MS thesis defense
Satisfactory completion of a minimum of 30 graduate course credits	6 semesters from MS thesis defense
Admission to Doctoral Candidacy	6 semesters from M.S. thesis defense
PhD Dissertation Progress Report	6 semesters from Qualifying Exam
Completion of PhD.	9 semesters from M.S. thesis defense
<u>2. Starting with M.S. Degree Deadline</u>	
Satisfactory completion of PhD. Qualifying Examination	4 semesters from enrollment
Satisfactory completion of a minimum of 45 graduate course credits	6 semesters from enrollment
Admission to Doctoral Candidacy	6 semesters from enrollment
Ph.D. Dissertation Progress Report	6 semesters from Qualifying Exam
Completion of PhD	12 semesters from enrollment

Most of the forms can be obtained at the Office of Graduate Studies (Baldwin Hall 665).

MATERIALS SCIENCE AND ENGINEERING GRADUATE PROGRAM
UNIVERSITY OF CINCINNATI

Direct Ph.D. Program Request

(Action to be initiated by the student-no later than the end of the student's first academic year or if the student has already passed the PhD Qualifying examination in one attempt, no later than the end of second academic year)

Student Name: _____

Date of starting: _____

Advisor: _____

The following requirements have been met:

Program Requirements

Student Record

Core Courses (QPA 3.5 or better for a minimum of 12 Credits)

of Credit Hours: _____

QPA: _____

All Graduate Courses (QPA 3.5 or better for minimum of 18 credits)

of Credit Hours: _____

QPA: _____

Date of Ph.D. Qualifying Examination: _____

Passed: Yes / No

Advisor's Signature: _____

Ph.D. Direct Approval (Yes/No) _____

If No, Comments: _____

Graduate Studies Director Approval: _____ Date _____

Note: All forms to be returned to GSO, 665 Baldwin Hall
Form 09-1

MATERIALS SCIENCE AND ENGINEERING GRADUATE PROGRAM
UNIVERSITY OF CINCINNATI

Ph.D. Qualifying Examination Declaration

Name: _____

M No.: _____

Advisor's

Name _____

Date of enrollment in the Department

(month/year)_____

The degree at the time of enrollment: BS _____ or MS _____

_____ I plan to take the Ph.D. qualifying examination in the
_____ semester of _____ in the discipline of:
polymers _____ metals/ceramics _____

For those who are required to take the qualifier in the following semester, but unable to take it must provide approval from Graduate Director and Research Supervisor.

State the reason _____

Supervisor Signature _____

Graduate Director Signature _____

Signature _____ Date _____

MATERIALS SCIENCE AND ENGINEERING GRADUATE PROGRAM
UNIVERSITY OF CINCINNATI
Ph.D. Qualifying Oral Examination Committee

Printed Committee Member Names:

Printed Name of Student: _____ **Mnumber:** _____ **Date:** _____

Area: Polymers / Ceramics / Metals

I. Evaluation of WRITTEN RESEARCH PROPOSAL

II. Evaluation of ORAL PRESENTATION of the RESEARCH PROPOSAL

III. Questions Asked on RESEARCH PROPOSAL and Evaluation of Answers

Overall Grade: (Pass or Fail)

Signatures of Committee Members:

Note: All forms to be returned to Qualifying Exam Committee Chair Form 09 - 3

MATERIALS SCIENCE AND ENGINEERING GRADUATE PROGRAM
UNIVERSITY OF CINCINNATI

APPLICATION FOR ADMISSION TO Ph D CANDIDACY

(TO BE INITIATED BY STUDENT WITHIN ONE ACADEMIC YEAR OF
PASSING PHD QUALIFYING EXAMINATION AND SUBMITTED TO
GRADUATE PROGRAM OFFICE)

Name of Student _____ Date _____

Name of Thesis Advisor _____

Thesis Examination Committee Members:

Committee not yet Selected: _____

No of course Credits Taken:

_____ Are all Core Course

Requirements Satisfied? Yes / No

Date of Qualifying Examination Pass _____

Date of Oral English Proficiency Test Pass _____

Advisor Signature _____

Checked against Departmental Record: _____
(Grad Director)

Graduate Studies Director Approval _____ Date: _____

Note: All forms to be returned to GSO, 665 Baldwin Form 09 -10

**MATERIALS SCIENCE AND ENGINEERING GRADUATE PROGRAM
UNIVERSITY OF CINCINNATI**

SELECTION: PHD PROGRESS REVIEW/THESIS COMMITTEE

[To be initiated by the student (post Doctoral Candidacy), in consultation with Thesis Advisor, and submitted to the Graduate Studies Director for approval]

Name of Student _____

Date first enrolled in the Department _____

Date of qualifying examination(s) _____

Was M.S. degree earned/Direct Ph.D. approved? Date _____

Thesis Title (initial)

Thesis advisor _____

Committee members suggested (3 or more)

Additional members appointed by the Graduate Studies Committee

Approval: _____
Grad. Studies Director

Date _____

[Note: This form must be accompanied by a short abstract of the dissertation research (less than 400 words).

**MATERIALS SCIENCE AND ENGINEERING GRADUATE PROGRAM
UNIVERSITY OF CINCINNATI**

PROGRESS REVIEW EXAMINATION FORM

(TO BE INITIATED BY THE STUDENT AND COORDINATED THROUGH
GRADUATE PROGRAM OFFICE)

Student _____ Advisor _____

Date of first enrollment in the Department _____

Date of qualifying examination(s) _____

Was M.S. degree earned/direct Ph.D. approved? Date _____

No. of Course credits taken _____ QPA _____

Course deficiencies (F, N, I, U, or Y), list the course title, qtr, & grade

If not first review list the dates of previous progress reviews

Committee: Is another review recommended before final defense? Yes / No _____

If yes, recommended date for the next review: (mo./ yr.) _____

Specific **Committee Thesis suggestions** (on dissertation research -use extra sheets, if needed):

Thesis Committee:

Signature: _____ Signature: _____

Signature

Signature

Signature

Graduate Studies Director Approval _____

Date:

Note: All forms to be returned to GSO,

Form 09 - 11

**MATERIALS SCIENCE AND ENGINEERING GRADUATE PROGRAM
UNIVERSITY OF CINCINNATI**

PhD THESIS DEFENSE SCHEDULING

(TO BE INITIATED BY THE STUDENT AND COORDINATED THROUGH MS&E
GRADUATE PROGRAM OFFICE)

Name of student _____ Date: _____

Date of defense _____ Time _____ Room _____

Dissertation Title:

Committee members: _____ Advisor

Dates of Progress Review _____

Title and full reference of a publication a refereed journal. (Cite the most
Important publication if there are more than one. If no publications available, give the title of a manuscript
ready for submission). A reprint (or the manuscript) has to be attached.

Signature of Advisor _____ Date: _____

Certification of fulfillment of all other requirements by:

Program Coordinator _____ Date: _____

Graduate Studies Director approval _____ Date: _____

Note: All forms to be returned to GSO, 665 Baldwin

Form 09- 12

MATERIALS SCIENCE AND ENGINEERING GRADUATE PROGRAM
UNIVERSITY OF CINCINNATI

PHD DISSERTATION EXAMINATION REPORT

(FORM TO BE INITIATED BY THE STUDENT AND COORDINATED THROUGH
GRADUATE PROGRAM OFFICE)

Name of Student: _____ Date: _____

Advisor: _____

Dissertation (Thesis) Title:

Committee Thesis Approval. Thesis Approved: _____
Approved Pending Revisions: _____

Final Thesis Course Grade:

Suggested Revisions:

Thesis Committee Signatures:

Advisor:

Signature Signature Signature

Signature Signature Signature

Graduate Studies Director Approval _____ Date: _____

Note: All forms to be returned to GSO, 665 Baldwin Hall Form 09 – 11

**MATERIALS SCIENCE AND ENGINEERING GRADUATE PROGRAM
UNIVERSITY OF CINCINNATI**

Official Advisor Selection Form

To: Graduate Studies Office and MSE Graduate Program Director

From: Faculty Advisor

Please be advised that I have agreed to be the academic advisor for the graduate student below, who will be working towards his/her MS/ PhD degree objective in the MSE Program.

Students Last Name

First Name

ML#: _____

Student ID _____

Email: _____

Pursuant to this agreement, I will provide the needed guidance, laboratory facilities, and financial support, as detailed below, and as discussed with and agreed to by the student.

Advisor Name:

The above named advisor intends to offer the student the following financial aid:

- University Graduate Scholarship (tuition only; does not include fees)
- Graduate Assistantship (includes University Graduate Scholarship and fees)
- Graduate Research Assistantship (Funding Agency and Grant # _____)
- Other (explain) _____
- Advisor does not intend to offer the student financial aid

Student signature

Date

Advisor signature

Date

Graduate Studies Director signature

Date

Forms should be returned to GSO office, 665 Baldwin.

MATERIALS SCIENCE AND ENGINEERING GRADUATE PROGRAM
UNIVERSITY OF CINCINNATI

MS. THESIS COMMITTEE APPROVAL FORM

(Action to be initiated by the student and his/her advisor)

Name of Student: _____ Date: _____

Area: Polymers / Ceramics / Metals

Proposed Thesis Title:

Suggested Committee Members: _____ Advisor

Signature of Advisor: _____ Date: _____

Additional Committee Members Suggested by MSE Graduate committee

Approval Graduate Studies Director: _____ Date: _____

Note: All forms to be returned to Graduate Student Office, 665 Baldwin Hall

Form 12-14

MATERIALS SCIENCE AND ENGINEERING GRADUATE PROGRAM
UNIVERSITY OF CINCINNATI

MASTER OF SCIENCE THESIS EXAMINATION FORM

(To be initiated by MSE Graduate program office at the time of thesis defense)

Name of Student: _____ Date: _____

Area: (circle one) Polymers / Ceramics / Metals

Degree Held: _____ Universities: _____

Final Thesis Title:

Thesis Title (circle one).....Approved/ Not Approved

Final MS Thesis Defense Examination

Examination (circle one)Approved/ Pending Revisions/ Not Approved

Date: _____ Final Grade: _____

Committee Suggested Revisions:

Does the Graduate committee recommend that the candidate continue for the PhD degree by taking the Qualifying Examinations? (Circle One).....Yes/No

Signature of Graduate Committee: _____ Chair/Advisor

Approval Graduate Studies Director: _____ Date: _____

Degree Granted: _____ Date: _____

All completed forms must be returned to the GSO office, 665 Baldwin Hall

**MATERIALS SCIENCE AND ENGINEERING GRADUATE PROGRAM
UNIVERSITY OF CINCINNATI**

M.S. NON-THESIS APPROVAL FORM

(To be initiated by the student and coordinated through MSE graduate program office at the time of thesis defense)

Name of Student: _____ Date: _____

Area: (circle one) Polymers / Ceramics / Metals

Advisor: _____

Title of Report Title:

—

Approved / Approved Pending Revisions

Advisor

Date

Suggested Revisions

Graduate Studies Advisor: _____ Date: _____

Return all completed Forms to GSO office, 665 Baldwin Hall