

MATERIALS/METALLURGICAL ENGINEERING, PH.D.

The Department of Metallurgical & Materials Engineering (MTE) offers a masters of science along with a Ph.D. In addition, many of the MTE faculty are members of the UA Tri-campus Materials Science PhD program giving materials orientated graduate students a range of academic opportunities.

Admission Requirements

The program for the PhD in the area of materials/metallurgical engineering is conducted jointly with The University of Alabama at Birmingham (UAB). This arrangement permits sharing of facilities, exchange of faculty, joint seminars, and a wide choice of dissertation advisers. The PhD degree in the area of materials science is also offered, in collaboration with UAB and The University of Alabama in Huntsville. Full details of this interdisciplinary program may be found in this catalog.

For additional information, see the Graduate School's general requirements for advanced degrees below.

See the Admission Criteria section of this catalog for more information.

Curricular Requirements

A defined field of specialization is required of all candidates for the doctor of philosophy degree. A minimum of **36 semester hours** of non-dissertation course credit is required. These courses must be at the 500/600-level. **Unlike the M.S. degree which can accept up to two prior approved 400-level courses for the M.S. Degree, this is not an option for the Ph.D. course requirements.** Ph.D.-track students should consult their graduate supervisory committee on courses that are suited to fulfilling their course of study in the department and research specialty. The doctoral course as a whole must be unified, and all its parts must contribute to an organized program of study and research. In addition, a student must complete a minimum of **24 hours of dissertation research (MTE 699)**. Students enrolled in the Ph.D.-track should register for MTE 699. Please consult the UA Graduate Catalog, Graduate Dean, and Graduate School for other university requirements..

Additional requirements set forth by the Graduate School and MTE Department include the following:

1. **Seminar.** The MTE department will still host seminars periodically through each semester. All graduate students, whether MTE or Materials Science designated, that reside in the MTE department are required to attend departmental seminars as part of their employment or fellowship obligations. If a student cannot attend a seminar, the student must inform the MTE graduate coordinator and advisor prior to the seminar providing documentation of the conflict, such as a class or medical appointment. Students that fail to attend seminar, without prior approval, will be required to meet with the MTE department head with his/her advisor to explain any absences. Unexcused absences can result in a loss of financial support. As part of seminar series, the MTE faculty encourages students to engage and participate in the Q&A. Also, please demonstrate proper seminar etiquette of turning your cell phone off (or on mute) as well as avoid doing email or surfing the internet on any electronic devices.
2. **500- and 600-Level Courses.** At least 36 hours of course work is required at the 500/600 levels.
3. **MTE 698 Non Dissertation Research:** Ph.D. students who conduct research prior to admission to candidacy can enroll in non-dissertation research credits (MTE 698) with the course name and content suited to the research specialty. It is suggested that no more

than 3 credits of MTE 698 be enrolled in any one semester. Per the UA graduate school catalog, "a maximum of 20 percent of a graduate student's required course credit may be taken on a pass/fail basis". As such, a student can apply a maximum of 7 credits of MTE 698 towards the required 36 semester course credits for Ph.D. degree if no other pass/fail graduate courses are used in the plan of study.

4. **MTE 699 Dissertation Research:** A minimum of 24 hours of MTE 699 dissertation work must be completed for the Ph.D. degree. The amount of dissertation research for which a student enrolls in any given semester should be commensurate with the progress a student is expected to make on the dissertation, as well as reflective of the extent to which University facilities and faculty time are invested in the proposed activities.
5. **Math requirement.** At least six (6) hours of GES 500 Engineering Statistics level or higher math courses must be completed for a Ph.D. degree.
6. **MTE core courses:** All Ph.D. students are required to take a common set of three core courses (9 total semester hours) as follows:

MTE Core Courses		Hours
MTE 556	Advanced Mechanical Behavior	3
MTE 562	Metallurgical Thermodyn	3
MTE 579	Advanced Physical Metallurgy	3
Total Hours		9

Curricular Table		Hours
MTE Core Coursework		9
Elective Coursework		27
MTE 699 Dissertation Research (minimum)		24
Total Hours		60

Transfer Credit

For students entering into the Ph.D. program, a maximum of 1/2 of the M.S. course work hours (non-thesis research) in the major or related field area of study can be transferred towards the Ph.D. program's coursework hour minimum requirement. This transfer of course hours is subject to approval by the MTE department and the Graduate School according to their policy.

Doctoral Plan of Study Requirement

Early in the graduate program, each Ph.D.-track student must confer with the appropriate departmental adviser or major professor to select courses, plan of study, research direction, any residency requirements will be completed, and so forth. At that time, a Plan of Study must be prepared and submitted to the Graduate School. The PhD Plan of Study can be found at the Graduate School website. All doctoral students must have a completed Plan of Study approved by the Graduate School no later than the semester during which the student will complete 30 semester hours of UA and/or transfer credit toward the doctoral degree. Otherwise, a "hold" may be placed on future registrations. An amended Plan of Study (if needed) must be submitted to the Graduate School when the student submits an approved form for Admission to Candidacy for Doctoral Degree.

Comprehensive Exams

After completing the core course requirements, the student is now eligible to complete the written examination, oral examination, and

research proposal examination. The guidelines for these examinations are as follows:

1. The student, with the graduate advisor, will assemble a supervisory or dissertation committee consisting of at least five total members. The student will present a research proposal to the dissertation committee that integrates the graduate course work and a literature review of the topic that demonstrates scholarly proficiency and capacity for independent, original investigation in his/her specialized field of research. This proposal should be given to the committee within two semesters of completing the core course requirements. This should be completed in less than three years of continuous graduate school attendance.
2. Each committee member will provide up to two (2) written questions within ten (10) days of receiving the proposal. These questions provide the written portion of the doctoral degree exam. The committee chair will coordinate the collection of these questions, assemble them, and then disseminate them to the student. These questions are based upon undergraduate and graduate material in metallurgical and materials engineering principles. These questions are to ensure that the fundamental understanding of materials science is achieved by the student. **The student will provide a written response to each question and submit them to the committee chair within five (5) days of receiving them.** The committee chairperson will then disseminate the student answers to the committee members for evaluation. As a courtesy to the committee, the primary advisor should submit the student responses to the committee at least five (5) days prior to the oral exam date.
3. At the oral examination of the proposal, the student will present a series of slides (which should be numbered) based on the written proposal. It is recommended that the number of slides is no more than thirty (30). This presentation will be open to the public and is recommended to be thirty (30) minutes. At the conclusion of the presentation, the public is excused and the oral examination by the committee members occurs. The closed-door examination is not to exceed two hours (120 minutes) in duration. The committee will ask questions related to the topic of the proposal to ascertain the student's competency in the subject, ability to compile information to conduct doctoral-level research, and follow-up questions (if necessary) related to the written responses to the questions previously provided by the committee.
4. The research proposal will follow the National Science Foundation (NSF) grant proposal guidelines. This includes no more than a one-page length abstract summary that includes the overview, intellectual and broader impact of the research, a table of contents, and up to 15-pages of technical content. References are treated as a separate section and do not count in the page limit and should follow the NSF guidelines for referencing (i.e., full author list, the title of the article, etc.). The student should provide a CV, a facilities section for the resources needed to complete the research, and a budget and justification as additional resource material to the proposal which are also not part of the 15-page limit of technical content. The technical content of the proposal should include (1) the integration of prior, referenced literature to the proposed topic which demonstrates an adequate understanding for doctoral-level research, (2) clearly defined scientific questions and/or technical objectives that the dissertation will address, and (3) proposed methods of investigation to address those questions posed. Prior work completed in the lab by the student should be used sparingly; **the proposal is not a summary of research completed but what is being planned.** The proposal is given to the supervisory committee **no later than three (3) weeks before a commonly agreed date to orally defend the proposal**, where

the student will answer questions related to relevant course work and the research proposal which satisfies the oral examination requirement for the doctoral degree examination.

5. After the completion of the oral examination, the student will be excused and the committee will assess the student's performance on the written exam, oral exam, and research proposal. A majority vote of the committee approves the student to candidacy. If the student does not receive a majority vote, the student is eligible for a second attempt. If the student is unable to receive a majority vote upon the second attempt (written exam, oral exam, and research proposal), the student is ineligible to receive a doctoral degree from the program. If the vote is tied, this is equivalent to not receiving a majority.

Admission to Candidacy Requirements

Successful completion and passing of the Ph.D. competency examination and proposal defense transfers a Ph.D. student to a Ph.D. candidate, and the student is admitted to candidacy for the doctoral degree. The Admission to Candidacy for the Doctoral Degree form is submitted to the Graduate School.

Continuous Enrollment Policy

Graduate School Policy

Dissertation Requirements

After a student has successfully passed the Ph.D. examinations, the student, with the graduate advisor, will assemble a supervisory or dissertation committee consisting of at least five total members (see Dissertation Committee below). The student will present a research proposal that integrates the graduate course work and demonstrates scholarly proficiency, and capacity for independent, original investigation in their specialized field of research. The research proposal should include a one-page abstract summary, no more than fifteen (15) pages of technical content. The technical content should include the integration of prior, referenced literature to the proposed research which demonstrates adequate understanding of doctoral level research. This proposal should provide the basis for the dissertation. The proposal should include curriculum vitae of the student, budget and budget justification for the doctoral research project. These latter documents and the list of references are not included in the 15 page limit. The proposal should be given to your supervisory committee no later than two (2) weeks before a commonly agreed date where the student will answer questions related to course work and the research proposal provided.

The written research proposal will be presented and orally defended to the supervisory committee. This committee will evaluate the merit of the research proposal and oral presentation and provide constructive input for the research.

The proposal examination should be completed within three academic semesters of passing the Ph.D. examination and at least one academic term before the Ph.D. dissertation defense. See the UA graduate catalog for further details and required forms.

Time Limits

All requirements for the doctoral degree must be completed within seven (7) years (21 fall, spring, and summer semesters) following admission to the doctoral program. Also refer to the Graduate School Policy about time limits for degree completion requirements.

Academic Misconduct Information

Graduate School Policy

Withdrawals and Leave of Absence Information

Graduate School Information

Academic Grievances Information

Graduate School Information

Grades and Academic Standing

Graduate School Policy

Graduate School Deadlines Information

Graduate School Information

Application for Graduation Information

Graduate School Information