

# Materials Science

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| Degree Offered   | Materials Science PhD   |
| Website          | <a href="https://www.uab.edu/engineering/mme/graduate/tri-campus-phd-program">https://www.uab.edu/engineering/mme/graduate/tri-campus-phd-program</a> |
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## PhD Program

UAB participates in the tri-campus Materials Science PhD program, an interdisciplinary, interdepartmental, and intercampus doctoral program linking the three universities that comprise the University of Alabama System—the University of Alabama (Tuscaloosa), the University of Alabama at Birmingham, and the University of Alabama in Huntsville. This program is separate from the PhD in Materials Engineering offered by UAB's Materials Science and Engineering department, providing flexibility for students who may wish to study materials science while based in another department.

## Admission Requirements

In addition to the general Graduate School admission requirements, requirements for admission to the Materials Science PhD program include the following:

- A baccalaureate degree in materials, metallurgical, or ceramics engineering or in a similarly named engineering program. A student with an undergraduate degree in another field of engineering or in the sciences may also be accepted into the Materials Science program.
- An undergraduate GPA of 3.0 or better on a 4.0 scale on all degree major courses attempted
- CV/Résumé
- 3 recommendations from academic or professional contacts
- Original transcripts from all colleges and universities attended since high school must be sent directly to the UAB Graduate School (detailed instructions are included during the online application process)
- International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. [Click here for details](#)

## Additional Academic Policies

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined hours of Special Topics and/or Independent Study courses will be applied to the PhD without appeal to and approval from the Program Director.

UAB offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

## Coursework for Students with a BS

It is expected that students entering the PhD program with a BS degree will also earn a Plan II masters degree after completing the required coursework.

For a student entering with a BS degree from an undergraduate program in engineering or the physical sciences, a minimum of 72 credit hours of graduate credit are required according to the following guidelines:

- A minimum of 48 credit hours of approved graduate coursework related to materials science or a supportive field is required
  - No more than 15 hours may be at the 500 level; all remaining credits must be at the 700-level.
  - Because of the broad and interdisciplinary nature of Materials Science, there is no set list of required courses for all students. Students must take at least two courses in each of the three topic areas below (such that the course credits sum to at least 18 credits) within the first 24 months of enrollment. Students must take courses which address the three fundamental areas:
    - i. Structure and Properties of Materials (CE 750, CH 783, CH 784, MSE 724, MSE 729, MSE 733, MSE 735, MSE 736, PH 553, PH 554, PH 586, PH 587, PH 753, PH 754)
    - ii. Characterization and Testing (BME 535, CH 550, CH 774, MSE 533, MSE 728, MSE 770, PH 732, PH 733, PH 745)
    - iii. Thermodynamics and Processing (CH 525, CH 526, MSE 501, MSE 509, MSE 703, MSE 767, MSE 768, PH 510, PH 532, PH 533, PH 635, PH 715, PH 716).
  - At least 6 credit hours must be taken outside the student's home department. This is to ensure that the student achieves an understanding of the multi-disciplinary nature of materials science and must be completed prior to the PhD Dissertation Proposal Examination.
  - Full-time students must successfully complete seminar either in their home department or the MME department a minimum of 4 terms
  - GRD 717 Principles of Scientific Integrity is required for all UAB graduate students and can be counted toward the coursework requirement.
  - A student may apply 6 credit hours of non-dissertation research toward the coursework requirement.
  - Additional coursework may be required at the discretion of the dissertation committee.
- A minimum of 24 credit hours in MSE 799 Dissertation Research dissertation research after admission to candidacy.

## Coursework for Students with an MS

Students entering with a master's degree in Materials Science or a closely related field are required to successfully complete a minimum of 51 credit hours of graduate credit according to the following guidelines:

- A minimum of 27 credit hours of approved graduate coursework related to materials science or a supportive field is required
  - No more than 6 hours may be at the 500 level; all remaining credits must be at the 700-level.
  - Because of the broad and interdisciplinary nature of Materials Science, there is no set list of required courses for all students. Students must take at least two courses in each of the three topic areas below (such that the course credits sum to at least 18 credits) within the first 24 months of enrollment. Students must take courses which address the three fundamental areas:

- a. Structure and Properties of Materials (CE 750, CH 783, CH 784, MSE 724, MSE 729, MSE 733, MSE 735, MSE 736, PH 553, PH 554, PH 586, PH 587, PH 753, PH 754)
  - b. Characterization and Testing (BME 535, CH 550, CH 774, MSE 533, MSE 728, MSE 770, PH 732, PH 733, PH 745)
  - c. Thermodynamics and Processing (CH 525, CH 526, MSE 501, MSE 509, MSE 703, MSE 767, MSE 768, PH 510, PH 532, PH 533, PH 635, PH 715, PH 716).
- At least 6 credit hours must be taken outside the student's home department. This is to ensure that the student achieves an understanding of the multi-disciplinary nature of materials science and must be completed prior to the PhD Dissertation Proposal Examination.
  - Full-time students must successfully complete seminar either in their home department or the MME department a minimum of 4 terms
  - GRD 717 Principles of Scientific Integrity is required for all UAB graduate students and can be counted toward the coursework requirement.
  - A student may apply 6 credit hours of non-dissertation research toward the coursework requirement.
  - Additional coursework may be required at the discretion of the dissertation committee.
- A minimum of 24 credit hours in MSE 799 Dissertation Research dissertation research after admission to candidacy.

## Graduation Requirements

In addition to completing coursework requirements (above), doctoral students must form a Graduate Dissertation Committee consisting of at least five faculty members, the majority of which should be Materials Science faculty. At least one member must be Materials Science faculty from the University of Alabama (Tuscaloosa) or University of Alabama in Huntsville. Admission to candidacy must take place at least two semesters before the student may graduate. A student is eligible for admission to candidacy after successfully completing the following:

1. A written examination on topics related to the student's research
2. An oral dissertation proposal
3. A written dissertation proposal (following the NSF Proposal Preparation and Submission Guidelines),
4. Completion of GRD 717 Principles of Scientific Integrity.

A written dissertation embodying the results of the student's original research must then be publicly defended, approved by the committee, sent to a department-approved proofreader, and submitted to the Graduate School with edits incorporated.