DOCTOR OF PHILOSOPHY
WITH A MAJOR IN MATERIALS
SCIENCE AND ENGINEERING

The School of Materials Science and Engineering offers a program of study and research leading to the Doctor of Philosophy degree. The Ph.D. degree recognizes demonstrated proficiency and high achievement in research. Beyond mandatory core classes the students in the Ph.D. program pursue an individually structured study plan culminating in a dissertation that makes an original and substantial contribution to the fundamental knowledge in the field of study.

Students with a BS or MS degree in Materials Science and Engineering, Polymer Science and Engineering, Ceramic Engineering, Metallurgical Engineering, Chemical Engineering, Mechanical Engineering, Textile Engineering, Biomedical Engineering, Chemistry, Biology, Physics, or in a related field of science and engineering can be admitted in the Ph.D. program. Ph.D. admissions are generally granted with tuition waivers and financial assistance in the form of graduate research assistantships.

The MSE faculty have diverse research backgrounds and expertise in various areas of Materials Science and Engineering constituting three typical working groups: (a) Functional Materials, (b) Soft and Biomaterials, (c) Structural Materials, and spanning all forms and functions of materials. MSE students, research scientists, and faculty are currently engaged in research in the following general areas:

- Polymers and Macromolecules
- Biologically Enabled and Bioinspired Materials
- Nanomaterials and Nanoengineered Devices
- Computational Design, Modeling, and Simulations
- Functional Electronic and Optical Materials
- Fibers and Composites
- Energy Storage and Harvesting
- Advanced Structural Materials
- Multi-scale Structural & Chemical Characterization

When starting the Ph.D. program, students are considered to be ‘probational’ Ph.D. students, until they successfully complete the qualifying requirements at which point, they become ‘candidate’ Ph.D. students. The requirements for the Ph.D. candidacy are outlined below:

- Twelve hours from approved MSE curriculum (12 hours), if direct from B.S.
- Six hours from approved MSE curriculum (6.0 hours), if direct from M.S.
- Nine hours in an approved minor (9 hours)
- Pass the qualifying exam
- Complete all course work with a minimum GPA of 3.0
- Write, present and defend a Ph.D. dissertation
- Technical Communications (1.0 hour)
- Teaching assistant duties*

31 credit hours are required for Ph.D. if direct from BS
25 course credit hours are required for Ph.D. if direct from MS

*Teaching assistant assignments are part of the MSE graduate educational process as it contributes to training graduate students as academics and in research; consequently, all graduate students (GRA) are required to participate in TA activities.

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>MSE 6411</td>
<td>Thermodynamics of Materials</td>
<td>3</td>
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<tr>
<td>MSE 6402</td>
<td>Crystallography, Structure and Defects</td>
<td>3</td>
</tr>
<tr>
<td>MSE 6768</td>
<td>Polymer Structure, Physical Properties, and Characterization</td>
<td>3</td>
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Other Required Courses

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<tr>
<td>MSE 8200</td>
<td>Advanced Presentation Skills</td>
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<tr>
<td>MSE 8801</td>
<td>Special Topics (Seminar)</td>
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Responsible Conduct of Research (Online CITI and in-person PHIL 6000 class)

Safety Seminar and MSE Safety Exam

Minimum requirement – can be substituted for an approved technical communication alternative. Alternative advanced technical communication courses include MSE 6754, Engineering Communication. Only 1 hour of the alternative course credit will be allowed to satisfy total MSE hours required.