Materials Science and Engineering, Ph.D.

Curriculum in Doctor of Philosophy – Materials Science and Engineering

A candidate for the Ph.D. degree with a major in materials science and engineering must comply with the rules and regulations as outlined in the WVU Graduate Catalog and the specific requirements of the Statler College.

Program Requirements

The doctor of philosophy degree with a major in materials science and engineering is administered through the college’s interdisciplinary Ph.D. program. The research work for the doctoral dissertation must show a high degree of originality on the part of the student and must constitute an original contribution to the art and science of materials science and engineering.

All Ph.D. degree candidates are required to perform research and follow a planned program of study. The student’s research advisor, in conjunction with the student’s Advising and Examining Committee (AEC) will be responsible for determining the plan of study appropriate to the student’s needs. The underlying principle of the planned program is to provide the students with the necessary support to complete their degree and prepare them for their career.

Curriculum Requirements

A minimum GPA of 3.0 is required in all courses.

<table>
<thead>
<tr>
<th>Course Requirements</th>
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<tbody>
<tr>
<td>500-level or higher coursework</td>
<td>18</td>
</tr>
<tr>
<td>Materials Science and Engineering Seminar</td>
<td>2</td>
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<tr>
<td>Research</td>
<td>24</td>
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<tr>
<td>MAE 686 Materials Science and Engineering Seminar</td>
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<tr>
<td>MAE 797 Research</td>
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Examinations

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<tbody>
<tr>
<td>Qualifying Exam</td>
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<tr>
<td>Candidacy Exam</td>
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<td>Final Exam</td>
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<td>Total Hours</td>
<td>44</td>
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*Students admitted to the Ph.D. program must have completed or will need to complete the following set of core courses or equivalent: MAE 583, MAE 580, MAE 649.

Examinations

QUALIFYING EXAM

All students must take and pass a written qualifying examination. Normally, the qualifying examination is given no later than the end of the third semester of enrollment in their Ph.D. program. This examination is designed to assess the basic competency of students to determine whether or not they have sufficient knowledge of the discipline to undertake independent research. The structure of the Ph.D. qualifying examination for all students pursuing the Ph.D. degree in Materials Science and Engineering will be comprised of two components: a written examination that will test on the student’s knowledge in the three core areas studied in MAE 583 Thermodynamics and Kinetics of Materials, MAE 580 Crystallography and Crystals, and MAE 649 Microscopy of Materials or their equivalent, and a second examination that will be administered by the MS&E Faculty in the home department of the student’s Ph.D. advisor, and which should be consistent with the format used by that program/department for their qualifying exam. These two examinations will receive equal weighting in determining the student’s overall score on the qualifying examination. Students who do not pass either part or both parts of this exam on their initial attempt will be allowed a second attempt to pass either or both parts of the qualifying exam. If they are not successful on their second attempt, then they will be dismissed from the program.

CANDIDACY EXAMINATION

In order to be admitted to candidacy, the student must pass a candidacy exam, which is designed to evaluate the student’s overall ability to engage in high-level research. After passing the qualifying examination, the student must submit to the AEC a written research proposal of his/her planned dissertation work and successfully defend it in an oral examination. The research proposal must be approved by the student’s AEC. A student who has successfully completed all coursework, passed the qualifying examination, and successfully defended the research proposal, and receives the college’s approval becomes a candidate for a Ph.D. degree. Thereafter, the student will officially be engaged in dissertation research.
FINAL EXAMINATION

At the completion of the dissertation research, candidates must prepare a dissertation and pass the final oral examination (defense) administered by their AEC. This examination is open to the public and, in order to evaluate critically the student's competency, may include testing on material in related fields, as deemed necessary by the AEC.

Major Learning Outcomes

DOCTOR OF PHILOSOPHY (PHD)

Upon graduation with a Ph.D. degree from the Statler College of Engineering and Mineral Resources students will have:

• Ability to initiate research ideas in order to solve specific problems and to write research proposals on these ideas
• Have an expert-level understanding of the advanced principles of their fields of study
• Furthered a novel research idea which has contributed to the state of the art in their specific areas of expertise
• Ability to plan original research projects, to perform laboratory or field based experimental tasks, generate data from those tasks, and draw conclusions based on sound scientific and engineering principles
• Ability to develop innovative research in order to advance the frontiers of knowledge and secure sponsored research
• Ability to write technical articles for dissemination through peer-reviewed, refereed journals or other venues
• Ability to make oral and poster presentations at technical meetings
• Understanding of professional and ethical responsibilities in the practice of their profession to contribute to the well-being of society and to the advancement of their profession
• Demonstrated initiative in research planning and management, including safety and environmental issues
• Technical preparation for and an awareness of the need for life-long learning and continuing education