

# MECHANICAL ENGINEERING AND APPLIED MECHANICS, PHD

The PhD program is a dynamic, hands-on and research-focused degree program. Overseen by the Graduate Group in Mechanical Engineering and Applied Mechanics, students interact closely with faculty to pursue a degree tailored to their research interests. Each student's course of study is selected with the help of their advisor and is approved by the Graduate Group Chair. Dissertation research is guided by a faculty research advisor and a small committee of faculty with interests and competence in areas related to the dissertation.

The Ph.D. requirements include the completion of a minimum of 10 course units of graduate level coursework beyond the undergraduate program with a grade-point average of at least 3.0, satisfactory performance in the PhD-related exams, presentation of a departmental seminar, completion of the teaching practicum, and the submission and successful defense of an original and significant dissertation. The milestones in the PhD program are noted in the PhD Handbook.

**For more information:** <http://www.me.upenn.edu/prospective-students/doctoral/degree-overview.php>

View the University's Academic Rules for PhD Programs (<http://catalog.upenn.edu/pennbook/academic-rules-phd/>).

## Required Courses

The Ph.D. requirements include the completion of a minimum of 10 course units of graduate level coursework.

Code	Title	Course Units
<b>Mathematics</b>		
ENM 5200	Principles and Techniques of Applied Math I	
ENM 5210	Principles and Techniques of Applied Math II	
<b>MEAM Core Requirements</b>		
Select three of the following:		
MEAM 5190	Elasticity and Micromechanics of Materials	
MEAM 5300	Continuum Mechanics	
MEAM 5350	Advanced Dynamics	
MEAM 5610	Thermodynamics: Foundations, Energy, Materials	
MEAM 5700	Transport Processes I	
MEAM 6200	Advanced Robotics	
Depth Requirement <sup>1</sup>		
Breadth Requirement <sup>2</sup>		
Research-Related Courses <sup>3</sup>		

<sup>1</sup> At least one graduate course in MEAM beyond the core requirements is required to fulfill the Depth Requirement.

<sup>2</sup> At least one graduate course outside MEAM that is related to the student's research is required to fulfill the Breadth Requirement (not including ENM 5200 Principles and Techniques of Applied Math I or ENM 5210 Principles and Techniques of Applied Math II).

<sup>3</sup> At least three additional graduate courses that are related to the student's research are required to fulfill the Research Requirement.

In addition to the ten course units of graduate level work, students will complete:

- Responsible Conduct of Research in Engineering workshop in the first year (EAS 9000 Responsible Conduct for Research (RCR), Engineering)
- Three semesters of Teaching Practicum (MEAM 8950 Teaching Practicum; normally taken in 3rd, 4th and 5th semesters)
- Six semesters of the MEAM Seminar (MEAM 6990 MEAM Seminar)

The degree and major requirements displayed are intended as a guide for students entering in the Fall of 2024 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.