



UNIVERSITY OF DELAWARE  
**ENGINEERING**

Department of Materials Science & Engineering  
**GRADUATE OPPORTUNITIES**

## RESEARCH PROGRAMS

We offer research programs in the following  
Hard Materials and Soft Materials focus areas:

- ELECTRONIC MATERIALS
- INORGANIC-ORGANIC HYBRID MATERIALS
- SELF-ASSEMBLY OF MATERIALS
- THIN FILM MATERIALS
- MATERIALS CHARACTERIZATION
- POLYMERS
- BIOLOGICAL AND BIOMEDICAL MATERIALS
- PHOTOVOLTAICS
- PHOTONIC MATERIALS
- NANOMATERIALS
- COMPOSITES

Learn more at [mseg.udel.edu](http://mseg.udel.edu)

## DEGREES OFFERED

DOCTOR OF PHILOSOPHY (PH.D.)

MASTER OF SCIENCE  
(THESIS AND NON-THESIS)

4+1 – BS AND MS DEGREES IN FIVE YEARS

## CONTACT

Department of Materials  
Science & Engineering

201 Du Pont Hall  
Newark, DE 19716

P: (302) 831-7183

E: [matsci@udel.edu](mailto:matsci@udel.edu)



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UNIVERSITY OF DELAWARE  
**ENGINEERING**

Department of Materials Science & Engineering

# DOCTORATE IN MATERIALS SCIENCE & ENGINEERING

The department's major research efforts involve both "soft materials" consisting of polymers and biomaterials and "hard materials" consisting of electronic materials, inorganic and organic thin films, surfaces and interfaces, nanoscale materials and composites. There are ongoing fundamental studies of self-assembly in block copolymers, crystallization, morphology and the synthesis and characterization of advanced polymeric materials. The area of biomaterials brings together research in materials chemistry and biology with an emphasis on tissue engineering, responsive gels, biosensors, and drug delivery. Research in electronic materials is focused on III-V semiconductors for quantum dots, electroluminescent polymers for energy-efficient light emitting diodes and the development of materials and device structures for photovoltaic (solar energy) applications in conjunction with the Institute of Energy Conversion. Fiber reinforced composites are being investigated in conjunction with the Center for Composite Materials for applications that range from lightweight armor to civilian infrastructure (bridge) programs. The areas of inorganic thin films, surfaces and interfaces address the fundamental physical and chemical properties of nanostructured materials.

## RESEARCH AREAS OF FOCUS

- POLYMERS AND COMPOSITES
- BIOLOGICAL AND BIOMEDICAL MATERIALS
- PHOTOVOLTAICS
- PHOTONIC MATERIAL
- NANOMATERIALS
- ELECTRONIC MATERIALS
- INORGANIC-ORGANIC HYBRID MATERIALS
- SELF-ASSEMBLY OF MATERIALS
- THIN FILM MATERIALS
- MATERIALS CHARACTERIZATION



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# REQUIREMENTS

## PREREQUISITE REQUIREMENTS – PH.D. DEGREE

A student entering the Materials Science and Engineering Graduate Program normally possesses a bachelor's (or higher) degree in a physical science or engineering discipline. A successful candidate for admission would minimally have taken courses to the following levels: mathematics, through partial differential equations, physics, including mechanics, heat, electricity, magnetism and introductory modern physics, chemistry, through physical chemistry; and introduction to materials science. In addition, courses in thermodynamics, field concepts, phase transformations, biology, biochemistry, and structure and mechanical properties of materials are considered very useful.

## ADMISSIONS REQUIREMENTS – PH.D. DEGREE

Admission requirements are normally (1) completion of a bachelor's degree with a GPA of at least 3.2, (2) three excellent letters of recommendation from faculty or scholars, (3) a required minimum GRE score of 155 for the quantitative section with a combined total score of 300 for the verbal and quantitative sections, (4) TOEFL score of 79 or higher. Admission decisions are made by a committee of the Materials Science and Engineering faculty.

## PH.D. DEGREE CURRICULUM

The Doctor of Philosophy (Ph.D.) degree requires 33 total credits (24 credit hours of course work and 9 credits of MSEG969 doctoral dissertation work on a research topic approved by the student's advisor). Of the 24 credits (8 courses) of course work, 9 credits must be three required core courses, another 6 credits are chosen from an approved list of 5 non-core courses, and an additional 9 credits of technical electives must be chosen from the same approved list of 5 non-core courses or other courses approved by the student's research advisor. All Ph.D. candidates must pass their Ph.D. Qualifying Exam and be admitted into Doctoral Candidacy, complete a data defense, a dissertation (of publishable quality), and defend their dissertation research.

Students already holding a Masters degree from another

program or university accepted to the MSEG Ph.D. program are required to complete 9 credits of MSEG969 doctoral dissertation (after passing their Ph.D. Qualifying Exam and are admitted into Doctoral Candidacy) and will have their previous coursework evaluated by the faculty to determine if/which additional courses are required. They too will be required to complete a data defense, a dissertation (of publishable quality), and defend their dissertation research.

## APPLY ONLINE

For more information about graduate admission and to apply online, visit the Graduate College at <https://grad.udel.edu/apply/>.

## PROGRAM INFORMATION

[www.mseg.udel.edu/students/graduate/phd-requirements/](http://www.mseg.udel.edu/students/graduate/phd-requirements/)

## FUNDING

Awards of financial assistance (fellowships and assistantships)—which include graduate tuition and a competitive stipend—are made on the basis of merit. Students who complete applications by January 15 are given preference. Contact the faculty in your area(s) of interest to discuss potential research opportunities today!

## ADMISSION DEADLINES

**January 7:** Fall application deadline

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UNIVERSITY OF DELAWARE  
**ENGINEERING**

Department of Materials Science & Engineering

# MASTERS IN MATERIALS SCIENCE & ENGINEERING (MMSE)

The field of Materials Science and Engineering encompasses the broad disciplines of physics, chemistry, biology, and engineering by providing a platform for multidisciplinary activities across these fields. It integrates the role of research and education to develop and prepare students for today's challenges while giving them the breadth, perspective, versatility, and vision to adapt to the changing environment of tomorrow. The department's major research efforts involve both "soft materials" consisting of polymers and biomaterials and "hard materials" consisting of electronic materials, inorganic and organic thin films, surfaces and interfaces, nanoscale materials, and composites. There are ongoing fundamental studies of self-assembly in block copolymers, crystallization, morphology, and the synthesis and characterization of advanced polymeric materials. The area of biomaterials brings together research in materials chemistry and biology with an emphasis on tissue engineering, responsive gels, biosensors, and drug delivery.

## RESEARCH AREAS OF FOCUS

**POLYMERS AND COMPOSITES**  
**BIOLOGICAL AND BIOMEDICAL MATERIALS**  
**PHOTOVOLTAICS**  
**PHOTONIC MATERIAL**  
**NANOMATERIALS**  
**ELECTRONIC MATERIALS**  
**INORGANIC-ORGANIC HYBRID MATERIALS**  
**SELF-ASSEMBLY OF MATERIALS**  
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# REQUIREMENTS

## PREREQUISITE REQUIREMENTS – MMSE DEGREE

A student entering the Materials Science and Engineering Graduate Program normally possesses a bachelor's (or higher) degree in a physical science or engineering discipline. A successful candidate for admission would minimally have taken courses to the following levels: mathematics, through partial differential equations, physics, including mechanics, heat, electricity, magnetism and introductory modern physics, chemistry, through physical chemistry; and introduction to materials science. In addition, courses in thermodynamics, field concepts, phase transformations, biology, biochemistry, and structure and mechanical properties of materials are considered very useful.

## ADMISSIONS REQUIREMENTS – MMSE DEGREE

Admission requirements are normally (1) completion of a bachelor's degree with a GPA of at least 3.2, (2) three excellent letters of recommendation from faculty or scholars, (3) a required minimum GRE score of 155 for the quantitative section with a combined total score of 300 for the verbal and quantitative sections, (4) TOEFL score of 79 or higher. Admission decisions are made by a committee of the Materials Science and Engineering faculty.

## MMSE DEGREE CURRICULUM

**OPTION 1 – MASTERS THESIS DEGREE** The Masters (MMSE) Thesis degree requires 30 total credits (24 credit hours of course work and 6 credits of MSEG869 – master's thesis work on a research topic approved by your advisor). Of the 24 credits (8 courses) of course work, 9 credits must be three required core courses, another 6 credits are chosen from an approved list of 5 non-core courses, and an additional 9 credits of technical electives must be chosen from the same approved list of 5 non-core courses or other courses approved by the student's research advisor.

## OPTION 2 – MASTERS NON-THESIS DEGREE

The Masters (MMSE) Non-Thesis degree requires 30 total credits of course work. Of the 30 credits (10 courses) of course work, 9 credits must be three required core

courses, another 6 credits are chosen from an approved list of 5 non-core courses, and an additional 15 credits of technical electives must be chosen from the same approved list of 5 non-core courses or other courses approved by the student's academic advisor. The non-thesis degree is offered primarily for off-campus or part-time students, but is available to full-time students with permission from the MSEG graduate committee.

## APPLY ONLINE

For more information about graduate admission and to apply online, visit the Graduate College at

<https://grad.udel.edu/apply/>.

## PROGRAM INFORMATION

[www.mseg.udel.edu/students/graduate/ms-requirements/](http://www.mseg.udel.edu/students/graduate/ms-requirements/)

## ADMISSION DEADLINES

**January 7:** Fall application deadline

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UNIVERSITY OF DELAWARE  
**ENGINEERING**

Department of Materials Science & Engineering  
**3+2 MASTER'S PROGRAM**

## 3+2 PROGRAM DEGREE

WITH MILLERSVILLE UNIVERSITY &  
UNIVERSITY OF DELAWARE

Millersville University of Pennsylvania and the University of Delaware have established a comprehensive dual degree program that allows students to earn both a BA degree in Physics from Millersville University as well as a MS degree in Materials Science and Engineering from the University of Delaware in 5 years. In order to complete both degrees in 5 years, interested students enrolled in Millersville's Physics program should discuss this with their advisors as early as possible, meet all Millersville requirements, and apply to UD in the fall of their 3rd year or after earning 94 credits. Accepted students would attend UD for their 4th and 5th years, taking the required 36 credits to earn their MS degree. Students may count 26 of these credits from UD towards their Physics BA degree at Millersville.

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## APPLY ONLINE

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Learn more at [mse.g.udel.edu/3plus2.html](https://mse.g.udel.edu/3plus2.html)

# REQUIREMENTS

## PREREQUISITE REQUIREMENTS

### MILLERSVILLE UNIVERSITY

Students intending to transfer into the MMSE program should complete the admissions application for the University of Delaware by the completion of the fifth semester of their Baccalaureate degree program at Millersville University of Pennsylvania or upon earning 94 credits of approved courses for the program.

## ADMISSIONS REQUIREMENTS

### UNIVERSITY OF DELAWARE

Admission requirements are normally (1) a cumulative grade point average of 3.2 or higher, (2) three excellent letters of recommendation from faculty or scholars, and (3) a GRE total score (verbal plus quantitative) of at least 300. Admissions decisions are made by a committee of the Materials Science and Engineering faculty.

## MMSE DEGREE CURRICULUM

### 3+2 Program – Graduate Degree without Thesis

This Masters (MMSE) Non-Thesis degree requires 36 total credits of course work. Of the 36 credits (12 courses) of course work, 9 credits must be three required core courses, another 6 credits are chosen from an approved list of 5 non-core courses, and an additional 21 credits of technical electives must be chosen from the same approved list of 5 non-core courses or other courses approved by the student's academic advisor and will be related to the student's area of interest.

## APPLY ONLINE

For more information about graduate admission and to apply online, visit the Graduate College at

<https://grad.udel.edu/apply/>.

## PROGRAM INFORMATION

[www.mseg.udel.edu/students/integrated-msbs](http://www.mseg.udel.edu/students/integrated-msbs)

## ADMISSION DEADLINES

**January 7:** Fall application deadline

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