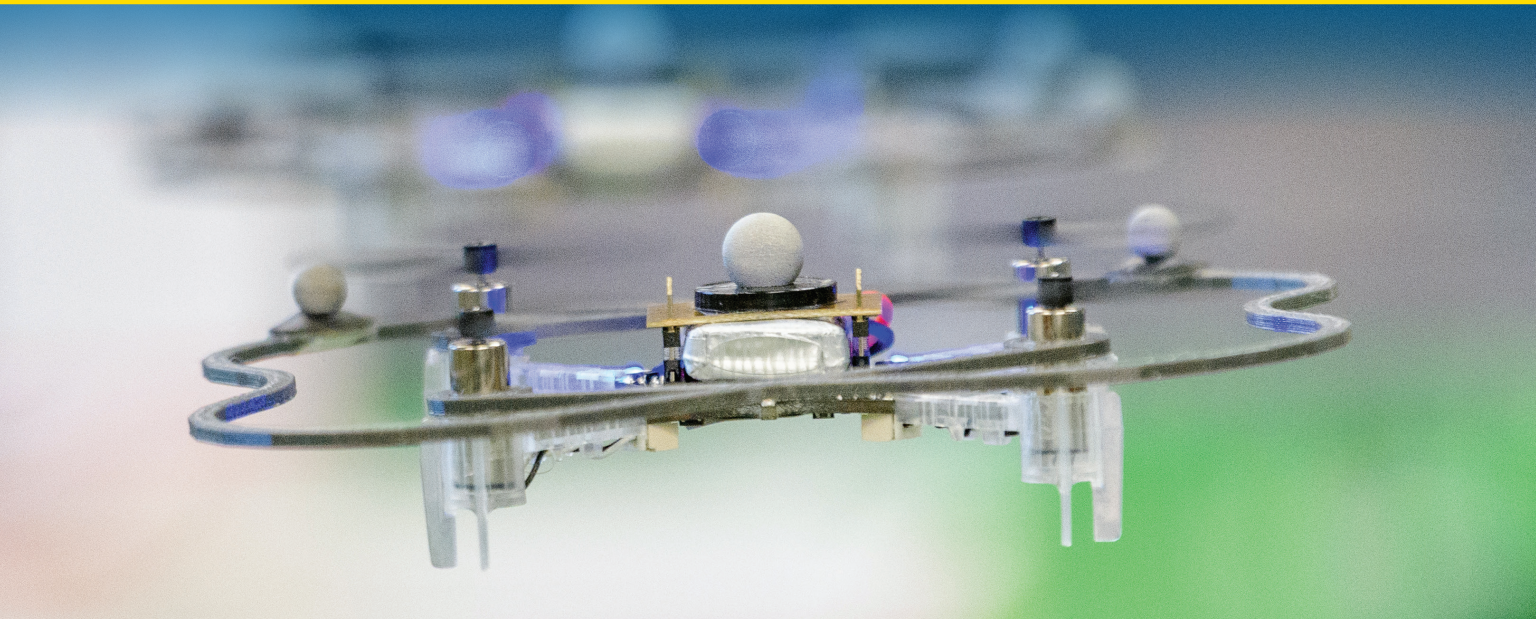
UNIVERSITY OF DELAWARE

COLLEGE OF ENGINEERING

DOCTORATE IN MECHANICAL ENGINEERING



The broadest of the engineering disciplines, mechanical engineering offers a wide range of research and career opportunities for those passionate about advancing innovations to enhance quality of life. The University of Delaware's (UD) Ph.D. program in mechanical engineering is highly regarded for our rigorous technical curriculum, internationally recognized faculty, and world-class, high-impact research in nearly every aspect of modern mechanical engineering.

Through this program we train the next generation of thought and innovation leaders for the private or public sector, industry, government, and academia. Focusing on critical areas ranging from sustainable energy to human health and national security, our faculty and students are making bold steps towards breakthrough technologies and new solutions to contemporary problems.

Learn more at **grad.udel.edu**

EXCEPTIONAL LEARNING OPPORTUNITIES

- Our faculty of internationally recognized scholars are affiliated with multidisciplinary research centers of excellence featuring state-of-the-art facilities, such as the Center for Composite Materials, Delaware Rehabilitation Institute, and Delaware Energy Institute. The Department of Mechanical Engineering houses the Center for Biomechanical Engineering Research and the Center for Fuel Cells and Batteries.

- UD is a Land Grant, Sea Grant and Space Grant Institution. The Carnegie Foundation for the Advancement of Teaching classifies UD as a research university with very high research activity—a designation accorded to fewer than 3 percent of U.S. colleges and universities.

- UD is centrally located along the nation's northeast corridor between New York and Washington, D.C., with major cities of Philadelphia and Baltimore, and government research laboratories, such as the U.S. Army Research Laboratory at Aberdeen Proving Ground and the U.S. Naval Research Laboratory, just a short drive away. Convenient access to transportation puts the cultural, economic and political centers of the world within your reach.

CORE RESEARCH AREAS

BIOMECHANICAL ENGINEERING

Integrate engineering design and problem-solving strategies with medicine and the biological sciences to help improve human health and quality of life. Research includes areas such as cartilage biomechanics for osteoarthritis, cell mechanobiology for osteoporosis treatment, musculoskeletal modeling and simulation for healthy and impaired movement, neuromuscular control for stroke patients, and sports medicine.

CLEAN ENERGY & ENVIRONMENT

One of the biggest challenges in today's world is sustainably generating, converting, transporting, storing and using energy. We have expertise in wind energy, environmental and engineering fluid dynamics, fuel cells, batteries, ultracapacitors, thermoelectrics, hybrid vehicle design and demonstration under intelligent control with real-time traffic feedback and more.

COMPOSITE MATERIALS

Composites and advanced materials have improved our lives. Research within the department encompasses advanced materials for fuel cells, nanomaterials and their integration in multifunctional composites, and virtual simulations of manufacturing processes.

NANOTECHNOLOGY

This field, which deals with the manipulation of materials at the atomic and molecular scales, has enabled the development of materials and devices that exhibit novel properties. Our expertise includes synthesis and characterization of nanoscale materials for durability, damage sensing, and structural health monitoring, scalable nanomanufacturing for battery and sensor applications, and more.

ROBOTICS & CONTROLS

This group designs robots that improve quality of life and develops algorithms that enable complex systems to realize their optimal behavior while interacting with their environment. Areas of expertise also include robotic navigation and mapping for exploration and intelligence gathering and human-assistive technologies for the visually or mobility-impaired.

TO APPLY

For more information about graduate admission and to apply online, visit the Office of Graduate and Professional Education at **www.udel.edu/gradoffice**. Applicants must have a bachelor's degree in mechanical engineering or a closely related field of engineering, science or mathematics.

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 15: Priority consideration for admission and to be considered for departmental funding.

July 31: Final deadline to apply.

CONTACT

Department of Mechanical Engineering
126 Spencer Lab
Newark, DE 19716
P: (302) 831-2423
E: me-gradinfo@udel.edu

Learn more at **www.me.udel.edu**

UNIVERSITY OF DELAWARE
GRADUATE COLLEGE

UNIVERSITY OF DELAWARE

COLLEGE OF ENGINEERING

MASTER OF SCIENCE IN MECHANICAL ENGINEERING

The Master's of Science in Mechanical Engineering (MSME) degree is designed to prepare engineers with Bachelor's degrees for their next step in their professional or academic career, and transition to positions of leadership. The program is designed to be flexible and provides students the freedom to shape their graduate experience according to their goals and aspirations. They can, for instance, either earn academic credit by participating in research activities within one of our world-class research laboratories, or engage early with potential employers through our innovative Graduate Student-Industry Partnership (GSIP) program.

Learn more at **grad.udel.edu**

EXCEPTIONAL LEARNING OPPORTUNITIES

- Choose a research-based thesis track or a coursework-based non-thesis track. The non-thesis Master of Science in Mechanical Engineering (MSME) option may be more suitable for part-time students. The MSME program is available on campus, 100% online or as a hybrid model mixing online and campus studies. Our student-industry partnership program allows students to earn credit toward their degree by engaging with local industry leaders and applying their knowledge to solve real-life problems.

- Our faculty of internationally recognized scholars are affiliated with multidisciplinary research centers of excellence featuring state-of-the-art facilities. Examples include the Center for Composite Materials, Delaware Rehabilitation Institute, Delaware Energy Institute and more. The Department of Mechanical Engineering houses the Center for Biomechanical Engineering Research and the Center for Fuel Cells and Batteries.

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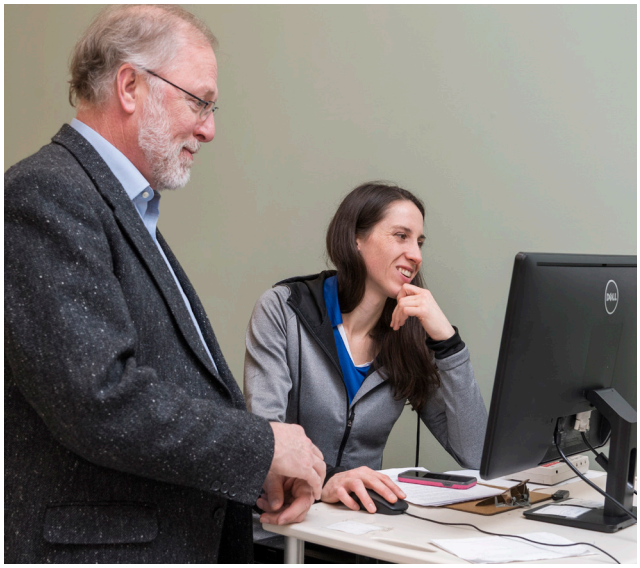

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ADMISSION DEADLINES

January 31: Priority consideration for fall admission

July 31: Final deadline to apply for fall admission

October 30: Priority consideration for spring admission

December 31: Final deadline to apply for spring admission

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COLLEGE OF ENGINEERING

MASTER OF SCIENCE IN ROBOTICS

Robotics applications, from drones to automated vehicles on land and sea, are surging in popularity as robotic devices become more sophisticated and accessible than ever before. The University of Delaware's interdisciplinary Master of Science in Robotics program is answering societal, government, and industry needs for specialized education in this field.

By emphasizing both theory and practice, the Master of Science in Robotics program is designed to meet the needs of professionals seeking advanced training as well as scholars who want to explore robotics through structured, guided instruction. Graduates of this program will gain scientific insights, a comprehensive understanding of robotics, and be prepared to develop and deploy robotic devices.

Learn more at **grad.udel.edu**

EXCEPTIONAL LEARNING OPPORTUNITIES

- Choose a research-based thesis track or a coursework-based non-thesis track. The curriculum consists of required courses and electives. The latter are selected from a diverse list of graduate courses and provide the opportunity for specialization in particular academic subareas such as control, estimation, optimization, or machine learning.

- UD has a tradition of excellence, from our roots extending back to a small private academy started in 1743, to the research-intensive, technologically advanced institution of today. UD is a Land Grant, Sea Grant and Space Grant Institution. The Carnegie Foundation for the Advancement of Teaching classifies UD as a research university with very high research activity—a designation accorded fewer than 3 percent of U.S. colleges and universities.

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ACADEMIC CONCENTRATIONS

CONTROL
Learn how to model systems and design algorithms to control their behavior with coursework in linear systems, stochastic optimal control, linear feedback control design or applied nonlinear control.

ESTIMATION
Quantify the movement of robotic systems through coursework in linear systems, basic state estimation, and advanced sensing and estimation for robotics and autonomous driving applications.

ARTIFICIAL INTELLIGENCE
Understand and design intelligent systems through coursework in algorithms, machine learning and computer vision.

DESIGN
Plan the construction of robotic systems through coursework in linear and nonlinear dynamics, autonomous driving, and environmental field robotics.

OPTIMIZATION
Learn how to improve the performance of robotic systems through coursework in optimization algorithms, game theory and mechanism design, and nonlinear programming.

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