



Doctoral students Zach Voras and Kristin de Ghetaldi, here with a sample of copal resin historically used by artists, are working in UD's Surface Analysis Facility to analyze and identify ingredients in paint samples of historic artworks.

AMBRE ALEXANDER

## Crossing disciplines, creating unique research opportunities

Researchers at the University of Delaware are crossing traditional departmental and college boundaries to explore novel research topics, and finding that collaborative perspectives can lead to new information and potential solutions.

### Chemistry is key to unlocking artful secrets

When the Smithsonian American Art Museum contacted Kristin de Ghetaldi and Zach Voras with questions about conserving artworks by African American painter Henry Ossawa Tanner, the two UD graduate students were already well on their way to becoming experts at using advanced chemical analysis to unlock the historical and scientific secrets contained in tiny paint samples.

Working in UD's cutting-edge Surface Analysis Facility, Ph.D. students de Ghetaldi (preservation studies) and Voras (chemistry) have been able to put the complex instruments—such as the “TOF-SIMS” or Time-of-Flight Secondary Ion Mass Spectrometer—to some brand-new uses.

De Ghetaldi, a graduate of the world-renowned Winterthur-UD Program in Art Conservation (WUDPAC), had extensive experience working in the science labs of art institutions, where the equipment consists mainly of conventional electron microscopes—which are effective at identifying inorganic components in paint samples (such as minerals), but not organic (such as natural resins).

Voras explained, “We can use the more specialized instruments to probe deeper, analyzing the pigment and nonpigment ingredients artists used. I’m not an art historian, but I can tell you chemically what’s there. That’s how our collaboration is transforming this research area.”

Henry Ossawa Tanner was known for experimenting with many organic materials in his paints: varnish, glue, oil, resin, lanolin, flax seeds and more, composing his paintings in numerous layers. Over the years, many of his works have deteriorated and are in need of repair and conservation.

De Ghetaldi said, “We’re hoping we can get information, layer by layer,

*(Continued on page 2)*

## Collaborative partnerships, interdisciplinary programs

Welcome to the Spring 2013 edition of *GradImpact*, the University of Delaware's Graduate and Professional Education newsletter. This edition highlights collaborative research partnerships and interdisciplinary programs on the UD campus. The global growth in interdisciplinary research has been embraced and encouraged by both federal and private funding agencies, and this has facilitated the proliferation of centers and institutes designed to improve quality of life by leveraging expertise from diverse disciplines. UD currently has more than 70 active centers, many of which incorporate researchers, educators and policymakers from different departments, colleges and industry.

Along with centers and institutes, there has been growth in interdisciplinary academic degree programs. Some programs, like the interdisciplinary program in Biomechanics and Movement Science, have precipitated the development of centers, namely, the Center for Biomedical Engineering Research. In other instances, highly active and successful centers such as the Disaster Research Center have precipitated the development of interdisciplinary graduate programs. The graduate program in Disaster Science and Management grew from the need to train individuals with expertise in both the social and scientific aspects of preparing for and responding to catastrophic emergencies.

Interdisciplinary graduate programs attract students from highly diverse fields and provide them with the opportunity to make unique contributions to specific problems while simultaneously learning from a wide spectrum of disciplines. As a result, students learn to incorporate new perspectives into their work, and to communicate effectively with policymakers, engineers, health care workers, educators, sociologists and others.

Successful interdisciplinary programs benefit from the participation of strong academic departments and from faculty willing to develop and engage in interdisciplinary education and research. The Office of Graduate and Professional Education looks forward to facilitating efforts to strengthen current programs, and to working with faculty and administrators to develop new programs that will prepare our next generation of leaders in academics, industry and public service.

### James Richards

*Vice Provost for Graduate and Professional Education,  
Distinguished Professor of Kinesiology and  
Applied Physiology*

## Research opportunities

(from page 1)

of all the materials he used, and the Smithsonian will be able to apply that knowledge to their conservation work on the paintings.”

In her own research, de Ghetaldi became fascinated with the idea of analyzing paint samples from historic artworks to discover who the first oil painters were. “From an art historical perspective, I’m interested in identifying the first Italians to begin experimenting with oil. Currently, there’s a hundred-year gap in our knowledge of this transition.”

Returning to UD after a three-year fellowship at the National Gallery of Art, she was excited by the opportunity to work in the surface analysis lab, partnering with Voras through Professor Thomas P. Beebe Jr., director of the Surface Analysis Facility. Both de Ghetaldi and Voras noted the enthusiastic support of Professor Beebe toward their interdisciplinary research project.

Now working together in the surface analysis lab for over a year, Voras and de Ghetaldi receive consultation requests from around the country, and have presented their research across the U.S. as well as internationally.

### The drive for renewable energy research

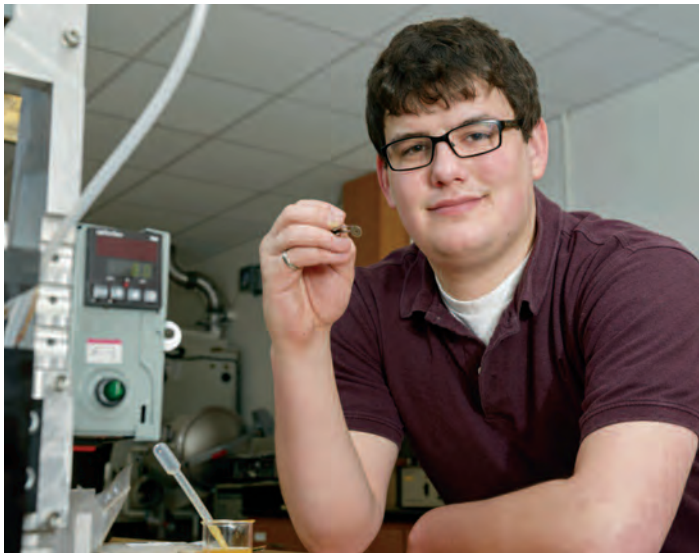
With a 2-megawatt wind turbine located on the Hugh R. Sharp Campus in Lewes, the University of Delaware is one of very few U.S. universities with access to a utility-scale wind turbine on campus. The result has been multiple research opportunities for both faculty and graduate students across UD departments and colleges.

Ben Gould is a Ph.D. student in mechanical engineering who is studying the problem of drivetrain failure in wind turbines, motivated by the fact that wind turbine gearboxes are often failing at a fraction of their 20-year design life.

“One of our overall research goals is the improvement and acceleration of wind turbine technology, while at the same time improving public opinion of wind energy’s reliability,” explained Gould. Working with David Burris, assistant professor of mechanical engineering, Gould’s research is focused on understanding and preventing drivetrain failure, which is the leading cause of turbine downtime and a huge cost to the industry’s renewable energy efforts.

“I have always been interested in renewable energy, and I knew that any graduate research I wanted to do would be in that field,” said Gould, who completed his undergraduate degree at UD in mechanical engineering with a minor in sustainable energy technology. While an undergraduate, Gould began working with Burris, and the two recently reported on their initial efforts at an international conference.

One of only three students at UD currently licensed to climb the wind turbine in Lewes, Gould has plans to mount strain gauges on



**Ben Gould**, doctoral student in mechanical engineering, is researching wind turbine drivetrain failure.

the turbine to measure several types of wind force that may be affecting components in ways that existing design specifications don't account for. Gould's lab-based research involves testing thrust bearings in contaminated oils, comparing how varying contamination factors may also affect the rate of wear.

UD's turbine was installed in partnership with wind turbine manufacturer Gamesa Technology Corp., as a result of synergies that emerged from wind research being conducted at UD's College of Earth, Ocean, and Environment (CEOE) and College of Engineering, the State of Delaware's interest in offshore wind, the City of Lewes' interest in innovative energy opportunities and Gamesa's interest in improving its understanding of the effects of marine conditions such as salt spray on turbine coatings, corrosion and avian impacts.

Other research projects involving the wind turbine have included corrosion studies in the marine biosciences program (CEOE); and the turbine's effect on bird and bat populations, in the Department of Entomology and Wildlife Ecology (College of Agriculture and Natural Resources).

## Discovering how robots learn

An interdisciplinary research group at UD is working on how robots can be more autonomous and responsive to their environments, as well as cooperate with each other in the field. Led by UD associate professors Jeffrey Heinz (linguistics and cognitive science) and Bert Tanner (mechanical engineering), the group studies how information from human language learning can inform how robots learn from their experiences to better accomplish mission objectives.

Both Tanner and Heinz were already using computational modeling in their respective fields, with Heinz examining the nature of human language acquisition, and Tanner looking for improved ways for robots to coordinate and communicate with each other as

well as learn from their experiences. They initially became aware of the common threads of their research at a University event where new faculty from across UD gave one-minute presentations about their research.

The eventual result was their National Science Foundation-funded project focused on improving programming codes for increasingly complex robot capabilities, by using principles from human language learning.

The innovative project has led to research opportunities for graduate students in both mechanical engineering and linguistics. Jie Fu and Konstantinos Karydis are mechanical engineering doctoral students in Tanner and Heinz's research group. "I am excited about the idea of incorporating language learning into control design in systems," said Fu. Added Karydis, "Working on interdisciplinary projects gives the opportunity for interesting questions to be asked, producing new ideas which can possibly have a large impact on everyday applications, society and science."

Group members Jane Chandlee and Cesar Koirala are doctoral students in linguistics and cognitive science. "Interdepartmental research is a great opportunity to think about how your own research area fits into a bigger picture," noted Chandlee. "When you collaborate with scholars from a field you thought was completely different from your own, you discover fascinating points of overlap that you would never have been aware of otherwise."

Both Heinz and Tanner agreed. "Working with this research group has been one of the highlights for me over the past few years," said Heinz. "It's been very stimulating intellectually and has broadened my perspective considerably. In fact, it has even made me think about my work in a new way."

And there's more to discover, as Tanner explained: "At this stage of the project we are looking at the next step, with ideas that involve game theory as a tool for identifying appropriate cooperative and antagonistic behaviors between robots. This broadens the area for potential application impact for this theory."

*Article by Nora Riehl Zelluk*



The research group led by **Jeffrey Heinz** and **Bert Tanner** includes (from left, seated) visiting scholar in computer science **Prof. James Rogers** of Earlham College, **Cesar Koirala**, **Jane Chandlee**, **Konstantinos Karydis**, **Tanner**; and (standing) **Heinz** and **Jie Fu**.

# Innovative collaborative programs

The increasingly complex scientific, technical and social challenges in our world often necessitate a convening of expertise across multiple fields. To prepare the specialized academicians and professionals who will address those challenges, the University of Delaware offers many interdisciplinary graduate programs that cross department and college boundaries.

Two examples of long-standing interdisciplinary programs at UD are energy and environmental policy, and biomechanics and movement science.

UD's Center for Energy and Environmental Policy has the distinction of having created the first interdisciplinary graduate energy and environmental policy degrees in the U.S. in 1997. The center's director is John Byrne, Distinguished Professor of Energy and Climate Policy, who contributed to Working Group III of the Intergovernmental Panel on Climate Change (IPCC), the international body that shared the 2007 Nobel Peace Prize with Albert (Al) Gore Jr. The graduate program draws its faculty from economics, bioresources engineering, geography, entomology and wildlife ecology, civil and environmental engineering and materials science and engineering.

According to the National Research Council, UD's interdisciplinary doctoral program in biomechanics and movement science currently ranks among top U.S. graduate programs in the field. Faculty are drawn from the College of Engineering (mechanical engineering, electrical and computer engineering) College of Arts and Sciences (biological sciences) and College of Health Sciences (physical therapy, kinesiology and applied physiology, behavioral health and nutrition, and nursing). Students gain research experience through involvement in over \$30 million in federally funded research projects and through interaction with a variety of interdisciplinary research groups.

Here are three relative newcomers to UD's interdisciplinary graduate offerings.

## Economic education

Traditionally, professionals and scholars in economic education have been trained in either economics or education, with little or no formal training in the other area. The need for financial literacy is growing, and so is the demand for professionals and scholars who can educate the community and influence school curricula about core economic issues.

With the goal of closing that gap, UD's Department of Economics and School of Education recently joined forces to launch a new and innovative doctoral program in economic education, drawing on the more than 40 years of expertise of UD's Center for Economic Education and Entrepreneurship.

"Economic problems have become more complex and so have the educational issues," said Saul Hoffman, professor and chair of the Department of Economics in the Alfred Lerner College of Business and Economics. "Having professionals in the field of economic education who have both sets of skills is absolutely necessary. With this curriculum design, there's literally nothing like it anywhere in the country. It's the premier program in economic education."

Doctoral candidate Erin Yetter will soon become the first graduate of the UD program, and has already begun her new position as an economic education specialist with the Federal Reserve Bank of St. Louis where she writes curriculum materials, conducts professional development for teachers and continues to research student learning of economic concepts. "I found the perfect career for my skill set and education," said Yetter. "I could not have found a better fit for what my training and education prepared me to do."

## Dual degree combines biology and business

With increasing career opportunities for Ph.D.-level biology graduates in fields like biotechnology, industrial science, pharmaceuticals, and other life sciences industries, the Department of Biological Sciences and Alfred Lerner College of Business and Economics recently partnered to offer a dual degree program leading to the Ph.D. in biological sciences plus the MBA degree.





*Lily Lamptey, UD doctoral student in energy and environmental policy, interviewing residents of the Ashanti Region in Ghana, where she is studying the issue of energy poverty.*

COURTESY OF LILY LAMPTEY

“Nearly half of life sciences graduate students intend to pursue careers in industry and government; thus, in our field, nonacademic career paths are the norm,” said UD’s Melinda Duncan, professor of biological sciences and graduate program chair. “The Ph.D./MBA is one of the department’s many efforts to encourage doctoral students to explore and prepare for the wide range of careers open to those with advanced life sciences training.”

One of the dual program’s first graduates is Weiping Wang, whose first industry position after completing postdoctoral benchwork was director of business development for a biotech business incubator. Her responsibilities included daily operations, recruitment of potential entrepreneurs and projects and building collaboration with Chinese industrial parks.

Having the business administration background of the MBA to supplement her Ph.D. in biology was a huge plus, said Wang. “The dual degree gave me a great advantage in what I was doing. With my biology background, I could understand the project concepts, but I could also analyze the feasibility of those projects. With my MBA training, I could work together with the scientists and entrepreneurs to market their products and understand their financial conditions.” Added Wang, “Being involved in the biotech field, I feel that I’m contributing to the technology advances that make people’s lives healthier and better. That is very exciting.”

**Disaster science and management**

UD’s Disaster Research Center is widely recognized as one of the pioneering institutions in the social scientific study of disasters. Building upon its nearly 50 years of expertise in the field, the center’s graduate program in disaster science and management accepted its first students in 2010. Faculty are drawn from civil and environmental engineering, nursing, marine science and policy, political science and international relations, public policy and administration and sociology and criminal justice.

Graduate students in the Ph.D. program represent a wide range of backgrounds and research interests, many having entered the program with extensive professional experience in the field.

Doctoral student James Goetschius has served for more than 16 years as a health facilities planner for the U.S. Army, and entered the program seeking additional expertise in engineering and public health topics. “A key feature of this program is its relationship with the Disaster Research Center, with resources that are unparalleled by any other school in the country,” said Goetschius. “The interdisciplinary nature of the program allows us to increase our expertise across a wide range of disciplines—the social sciences, engineering, public policy. We have the opportunity to work with experts across the University, both inside and outside the core faculty.”

Ryan Burke’s academic background is in military science and homeland security, in addition to having served on active duty as an officer in the Marine Corps involved in disaster preparedness activities. “In pursuing a doctoral level program in this field, I gravitated toward logistics and operations, and decision-making frameworks,” said Burke. “My background fit very well with this program.”

“I think one of the unique aspects of this program is the opportunity to build your own curriculum,” said Ph.D. candidate Danielle Nagele, whose background is in meteorology and emergency management. “I’ve combined civil engineering, sociology, public policy and other topics. Given our varying backgrounds and professional goals, it’s very helpful to have the freedom to do that.”

*Article by Nora Riehl Zelluk*



*Doctoral students in UD’s graduate program in disaster science and management include (standing, from left) James Goetschius, Alex Greer, Danielle Nagele and (seated) Ryan Burke.*

AMBRE ALEXANDER

# New state-of-the-art facility blends research, teaching

Set to open this fall, the University of Delaware's 194,000-square-foot Interdisciplinary Science and Engineering Laboratory (ISE Lab) will be a hub of teaching and research on campus.

ISE Lab's research wing will house core facilities for teams of researchers, including an imaging and microscopy suite, a 10,000-square-foot nanoprocessing facility, a synthesis lab for chemical research and an advanced materials characterization lab.

Classrooms will include the latest in educational technology and mobile furniture to facilitate group or individual work, none holding more than 48 students. Four problem-based learning laboratories adjoin the classrooms so students can discuss a problem and immediately test a solution.

This facility brings together students and faculty from departments and disciplines across UD to teach, learn and conduct research in a collaborative environment, with the goal that ISE Lab will engage

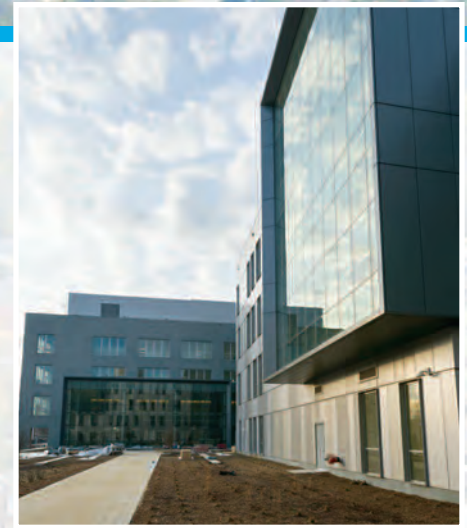
students and stimulate excitement about science and engineering.

With faculty appointments in biology, mathematics and bioinformatics, Professor John Jungck is UD's new director of interdisciplinary science instruction, tasked with coordinating ISE Lab's teaching and learning initiatives.

"We built the building, now we want to build a community," said Jungck. "The expectation is that with a different kind of environment, we have new opportunities."

"My job is to encourage interest and excitement across disciplines about teaching and learning in this facility, in a new context, a more open and engaging setting," continued Jungck. "Many traditional classrooms can be a bit like isolated walled kingdoms. A lecture class takes place in one location; and the corresponding lab may take place in a completely different location. We're trying to bring those communities together."

For undergraduate students, the ISE Lab



EVAN KRAPE


experience will include more problem-based learning integrated with classroom teaching, and more classes with a multidisciplinary focus. Classes from any academic department can be held in the ISE Lab.

For example, first-year science and mathematics education majors at UD will soon have the option to engage in an integrated seven-credit course that combines elements of math, science, technology and communication. Funded by a grant from the National Science Foundation, the course will utilize ISE Lab classrooms designed specifically for the kinds of problem-based learning that will distinguish this new curriculum.



*With plans for three green roofs and a courtyard landscape with native plants and an onsite drainage system, the ISE Lab was constructed following the standards of the U.S. Green Building Council's LEED Silver designation. Significant investment was made in environmentally friendly products, equipment and design standards.*

EVAN KRAPE



For graduate students, the goal is that with teaching and research all taking place in the ISE Lab, they will have the opportunity to become part of a larger research and teaching community. "Traditionally, graduate students in the sciences can sometimes be caught in a 'grad grind,' working many hours a week in labs or at teaching—in addition to their own academic pursuits—in relatively isolated environments," said Jungck.

By contrast, the ISE Lab was designed to foster community, with shared, open work spaces for graduate students, large lobby areas and group study rooms. Large-screen monitors will broadcast actual projects in progress from ISE Lab's specialized research facilities.

Many graduate students are also interested in a future teaching career. Jungck is collaborating with UD's Institute for Transforming Undergraduate Education, to explore ways that the University can expand teaching resources and training for graduate students, especially in the area of problem-based learning.

Construction on the ISE Lab facility should be completed this summer, with a grand opening slated to occur on Oct. 3.

Jungck summarized, "With this new facility, and the community we hope to create, this is an incredible opportunity to build something fresh and interesting, that will serve both undergraduate and graduate students really well."

Article by Nora Riehl Zelluk and Andrea Boyle Tippett

## Interdisciplinary research centers focus on energy and the environment

The Interdisciplinary Science and Engineering Laboratory will become the new home of these University of Delaware interdisciplinary research centers.

### Catalysis Center for Energy Innovation [www.efrc.udel.edu](http://www.efrc.udel.edu)

The Catalysis Center for Energy Innovation (CCEI) is a multi-institutional research center led by UD, which is comprised of more than 10 academic institutions and two national research laboratories. Supported by the U.S. Department of Energy, Office of Basic Energy Sciences, through its Energy Frontier Research Centers program since 2009, CCEI and its researchers are working to develop innovative catalytic technologies to efficiently convert biomass, such as trees and grasses, into chemicals and fuels.

The center provides an integrated approach to solving scientific and engineering problems that span across scales and disciplines, including synthesis and characterization of novel catalysts, development and application of multiscale modeling, reaction and reactor evaluation and technology transfer.

### University of Delaware Energy Institute [www.energy.udel.edu](http://www.energy.udel.edu)

The University of Delaware Energy Institute (UDEI) was established in 2008 to marshal and expand the University's science, engineering and public policy expertise in new and emerging energy technologies and, with its industry and government partners, to use this research to address the entire spectrum of challenges posed by future energy needs. UDEI's roles include evaluating and creating needed energy information, building teams for required research improvements, providing the bases for decision making, serving as a point of contact, supporting associated energy centers and institutes and disseminating information through a website, annual symposia and workshops focused on specific technologies and issues.

Its Council of Fellows is drawn from centers and departments across UD, including the Institute of Energy Conversion, Chemical and Biomolecular Engineering, Chemistry and Biochemistry, Materials Science and Engineering, Physics and Astronomy, Marine and Earth Studies, Center for Catalytic Science and Technology, Center for Fuel Cell Research, Mechanical Engineering and Catalysis Center for Energy Innovation.

### Delaware Environmental Institute [www.denin.udel.edu](http://www.denin.udel.edu)

The Delaware Environmental Institute (DENIN) is focused on research and partnerships that integrate environmental science, engineering, social science and policy that provide strategies for addressing environmental challenges facing Delaware and the nation, including climate change and sea-level rise, contaminated soil remediation, nutrient management and water quality. These efforts help sustain Delaware's economic pillars in agriculture, industry and tourism. In a short time, DENIN has forged a strong and cohesive network of distinguished scientists, engineers, educators and policy makers committed to world-class science and education.

DENIN affiliates include more than 125 research professionals and faculty from across UD as well as other Delaware institutions of higher education and research centers who are actively pursuing research or scholarly activities related to the environment.

# UD graduate education—online!

Online programs make a UD graduate education more accessible to today's students

Online education has been in the national news a lot lately, and it is definitely at the forefront of many agendas at the University of Delaware as well.

Accessibility for students is the key goal for online education, and that is what motivated the Alfred Lerner College of Business and Economics to create an innovative, new online master of business administration (MBA) program.

The online MBA will provide high-quality business education in a flexible format required by a growing segment of the student population.

"The landscape of higher education is changing as a result of new technology and the resulting changes in students' learning styles," said Rick Andrews, deputy dean in the Lerner College. "By using a new delivery modality, our MBA will be accessible to working professionals who travel frequently, to members of the U.S. military and to others who, for whatever reason, cannot make it to campus on a regular basis to participate in the traditional MBA."

Students in the new online MBA will complete 48 credits in the Lerner College's AACSB-accredited program over the course of eight seven-week terms.

Courses will consist of micro-lectures delivered in multimedia format; readings, problems, cases and discussion board participation; experiential learning via corporate simulation exercises; and individual and team projects and assignments.

"This is not a diluted product, half an MBA or MBA 'lite,' but a full MBA tailored to the needs of a different target audience and offering the same quality Lerner College MBA that our resident students receive," said Bruce Weber, dean of the Lerner College. "The proposition for prospective students is attractive, both in terms of knowledge gained and time to completion of the degree."

The online MBA initiative is not the first online graduate program at UD. Nursing and engineering degrees have been available in a distance learning format for years.

UD's School of Nursing offers master of science in nursing (MSN) degree programs in an online format. The clinical nurse specialist (CNS) program, with its specialty areas in adult gerontology and the nursing of children, is completely online, as is a CNS post-master's certificate. A health services administration concentration in the MSN is also 100% online.

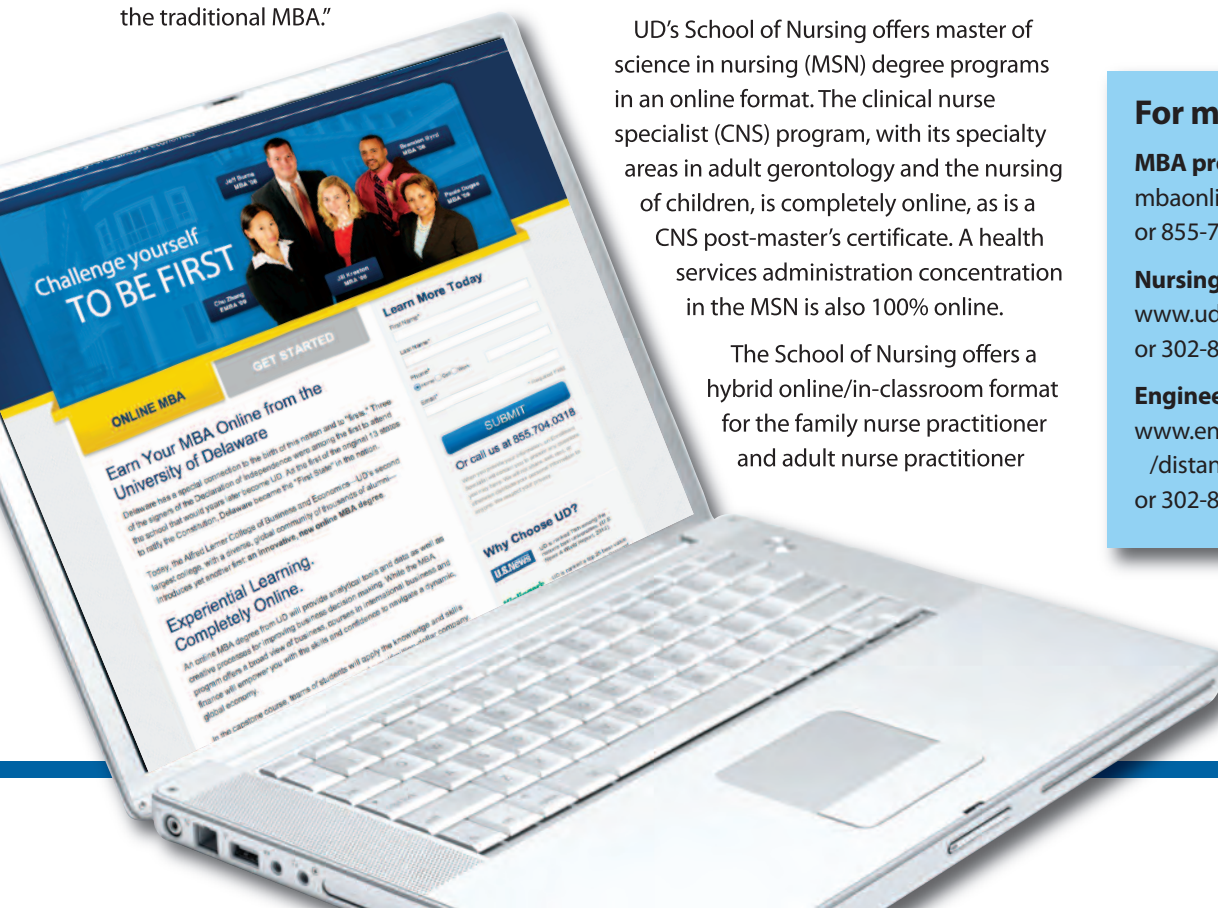
The School of Nursing offers a hybrid online/in-classroom format for the family nurse practitioner and adult nurse practitioner

MSN programs. Hybrid post-master's certificate programs are also offered in both those specialties.

Several engineering programs can be completed entirely through online study. A master of science in electrical and computer engineering (MSECE), a 30-credit, non-thesis degree, is offered completely online. An online graduate certificate in composite materials, designed for engineering and science professionals who are new to the field of composite materials or wish to expand their knowledge in that field, is also available. In addition, most of the coursework for a master of engineering, mechanical (MEM) degree can be completed online.

A growing list of graduate level engineering courses can also be taken in one or more distance formats (CD-ROM, DVD, web-streamed), providing a professional development opportunity for working engineers.

*Article by Kathryn Meier and Tara Kee*



## For more information

### MBA program:

[mbaonline.udel.edu](http://mbaonline.udel.edu)  
or 855-704-0318

### Nursing programs:

[www.udel.edu/nursing/graduates](http://www.udel.edu/nursing/graduates)  
or 302-831-8386

### Engineering programs:

[www.engr.udel.edu/outreach/  
/distance\\_learning.html](http://www.engr.udel.edu/outreach/distance_learning.html)  
or 302-831-8302



## Demystifying academic careers

Preparing University of Delaware doctoral students and postdoctoral scholars for the academic career path is the goal of a week-long summer institute at UD. With its fifth summer workshop coming up this year, the Putting Your Ph.D. to Work institute is presented by UD's Center for Teaching and Assessment of Learning and Career Services Center, in co-sponsorship with the Office of Graduate and Professional Education.

The institute's primary goals are to assist with preparation for the academic job search process, and acculturation and successful transition into the first year of a faculty appointment. Special focus is given to developing and honing job application documents such as the CV, cover letter, research statement, teaching statement



Participants in the Putting Your Ph.D. to Work 2009 summer institute included, front row, **Helene Delpeche, Mary McDonald, Elizabeth Soslau and Lauren Miltenberger**; and, back row, **Tracy Davenport, Deeanna Button, and Berit Rabe.**

and ePortfolio, with the help of instructor feedback and peer review.

Lauren Miltenberger participated in the 2009 institute as a doctoral candidate in public policy and credits the program

with helping her obtain her first full-time university teaching position in 2010. "The process of obtaining an academic position can seem very mysterious, and this program helped make it very clear and straightforward," said Miltenberger.

Now an assistant professor of public administration at Villanova University, Miltenberger added, "While you're in graduate school, you're focused on your studies, your dissertation, your research contribution, and the more practical concerns of actually finding a job are not covered in any course that you take as a graduate student. The program provided excellent advice and insights into that process."

## Supporting scholarship and field research for doctoral students

Ten doctoral students, working on a wide range of dissertation topics and in a variety of departments in the University of Delaware's College of Arts and Sciences, were selected for the college's inaugural Dean's Doctoral Student Summer Scholars program in 2012.

Offered with support from UD's Office of Graduate and Professional Education, the competitive program provided recipients with a 10-week, \$4,500 summer dissertation research and writing grant with the goal of enabling their scholarship and field-based study, supporting data collection and analysis and allowing them to focus on dissertation writing.

Lauren Balasco, a doctoral candidate in political science and international relations who is studying issues in transitional justice, used her grant to conduct field research. "Writing a dissertation is a huge hurdle, especially in the social sciences where external funding for one's research is limited. In my case, the program allowed me to spend my summer in Colombia and Peru, conducting interviews, doing library research, and interacting with local scholars, activities which will enrich my dissertation."



**Lauren Balasco at the Universidad Pontificia Javeriana's library in Bogotá, Colombia.**

An outreach component of the grant program requires recipients to share their dissertation research with public audiences. Balasco added, "The public engagement requirement has made me aware of the importance of being able to communicate my research to an audience beyond specialists. The emphasis that the program places on public engagement is a reminder that scholars have an obligation to society."



## HONORS & ACHIEVEMENTS

### Harvard center selects UD doctoral candidate for fellowship



**Atreakn Alleyne**, doctoral candidate in political science and international relations, has been selected as a Strategic Data Project Fellow by Harvard's Center for Education Policy Research. Alleyne, a resident of Camden, N.J., has been placed in a two-year fellowship in the Delaware Department of Education, where he will work with the Teacher and Leader

Effectiveness Unit to evaluate education reform efforts. Alleyne is also one of seven recipients of the 2012 national K. Patricia Cross Future Leaders Award recognizing graduate students who show exemplary promise as future leaders of higher education. He and his wife are the founders of a college-access organization for underrepresented students.

### Alumni appointments and awards

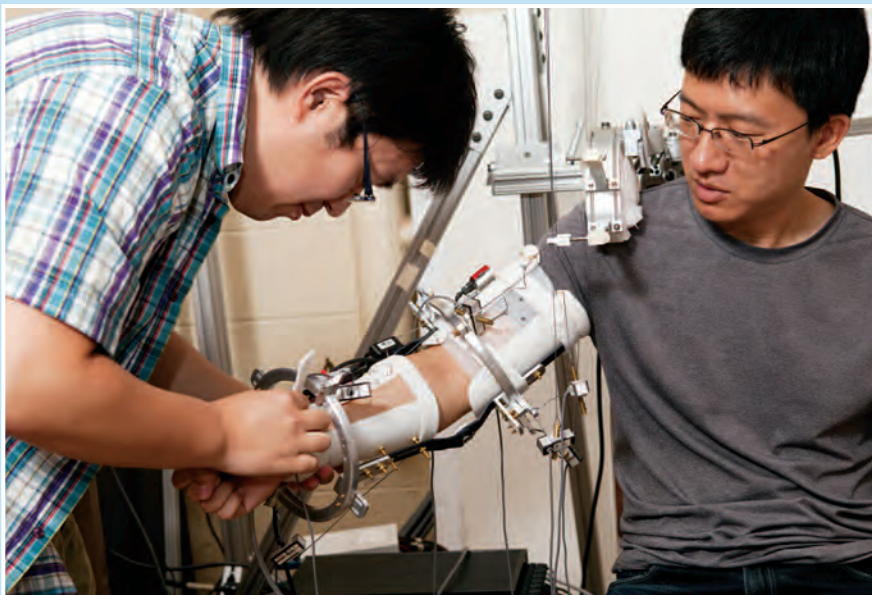
Oceanography alum **Luis A. Cifuentes** was recently named associate vice president for research and dean of graduate studies at Texas A&M University at Corpus Christi. After earning a Ph.D. in oceanography at UD in 1987, Cifuentes joined the faculty of Texas A&M in 1988 as an assistant professor in oceanography. His adviser in UD's School of Marine Science and Policy was Professor Jonathan H. Sharp, with whom he co-authored several papers on topics of estuarine research.



University of Delaware alumnus **Steven Leath** has been named the 15th president of Iowa State University. Leath received his master's degree from UD in 1981 in the Department of Plant and Soil Sciences in the College of Agriculture and Natural Resources. He credits his time and his professors at UD for preparing him for the future, saying, "The University of Delaware did a real good job of transforming college graduates into independent researchers."



### IEEE recognizes doctoral student's robotics work



KATHY ATKINSON

**Ying Mao** (left), UD doctoral student in mechanical engineering, developed improvements to the arm exoskeleton systems used in joint rehabilitation.

**Ying Mao**, doctoral student in mechanical engineering, earned the "Best Student Paper" award at the 2012 IEEE International Conference on Robotics and Automation out of nearly 800 accepted student papers. Titled "Transition from Mechanical Arm to Human Arm with CAREX: a Cable Driven ARm EXoskeleton (CAREX) for Neural Rehabilitation," the paper outlined Mao's improvements to the arm exoskeleton systems that are used in joint rehabilitation, in particular, to help patients regain neuromuscular functions in the arm following stroke. Mao's cable-driven CAREX system is lighter than conventional exoskeletons which makes agile arm movement possible, and does not require joint alignment between the patient and the machine.

**Norine Watson**, who earned bachelor's and master's degrees in nursing at UD, has been selected as the 2012 Nurse of the Year by the Nemours/Alfred I. duPont Hospital for Children where she is director of nursing excellence. The award recognizes Watson's impact on increased nursing satisfaction, educational preparation and national professional certification; engagement in exemplary practice; and, most important, designation by the American Nurses Credentialing Center as a magnet hospital. Watson served as president of the Delaware Nurses Association from 2008-10 and was a member of the executive board from 2007-11.



## SERVICE & ENGAGEMENT

### Engineering students create solar energy teaching module

In 2010, the Newark Center for Creative Learning (NCCL) was looking for new ways of teaching solar energy to middle-school students and approached UD's National Science Foundation-funded Integrative Graduate Education and Research Traineeship (IGERT) Solar Hydrogen program. The result was a creative new solar education outreach tool.

With help from **Prof. Bob Opila** in materials science and engineering, and **Dr. Steve Hegedus** from UD's Institute of Energy Conversion, a team of graduate student engineers designed and built a solar photovoltaic learning center dubbed the MSDS (Mobile Solar Demonstration System). It was an instant success at NCCL and beyond. The MSDS started appearing at events around the UD campus



and the larger community, as schools and other outreach programs requested the system for hands-on demonstrations of solar power. Original team members included **Cory Budischak, Keith Douglass, Erik Koepf, Sarah Mastroianni and Roy Murray**, together representing chemical, electrical and mechanical engineering; chemistry; and physics and astronomy.

To meet increased demand, Budischak and Koepf subsequently developed a second-generation demonstration module and formed the start-up company Illuminate Learning to design and manufacture solar learning tools for teachers and students. Currently, UD's Engineering Outreach Office is coordinating a statewide effort to bring solar learning into Delaware classrooms with a small fleet of solar learning stations, teacher seminars and a training video created with the assistance of University Media Services.

### International students lend a hand after Hurricane Sandy

Coordinated by master of public administration (MPA) student **Rafiq Gurbanzada**, an international group of UD graduate students joined forces to provide relief to local victims of Hurricane Sandy last fall. Responding to a call for volunteers from the Delaware Emergency Management Agency, Gurbanzada, along with fellow MPA student **Redhi Setiadi**, recruited additional grad students, and on Nov. 10, the group was able to assist a disabled Dover resident by pumping water out of his flooded basement.

The group's efforts were supported with logistics by the Zakat Foundation of America, an international faith-based relief organization.

Gurbanzada is an army officer attached to the Ministry of Emergency Situations of the Republic of Azerbaijan; Setiadi is an Indonesian International Education Foundation (IIEF) scholar studying local government organizations in rural settings. Additional UD graduate student volunteers were **Sebahattin Acikgoz, A. Caglar Deniz, Abdulkadir Ozden, Samet Ozturk, Ibrahim Temel, Burak Yildirim** and others.



### Nursing alumna relocates to practice in Alaska

**Teresa Frazier** graduated from UD's family nurse practitioner program in 2012, and in that same year, she moved to Alaska to begin a three-year commitment to serve as the primary health care provider in the remote Native Alaskan Yup'ik village of Togiak. Recruited by the Indian Health Service at a nursing conference she attended while in graduate school, she welcomed the challenge.



*Teresa Frazier moved to Alaska with her youngest daughter to serve as a family nurse practitioner with the Alaska Area Indian Health Service.*

"I was looking for a rural clinic setting to practice in, with the extreme variety of health care scenarios that come up," said Frazier. "Here, I see all ages and types of patients: emergency, prenatal, elderly, pediatric, chronic health conditions, acute conditions, everything. It's what I wanted to do."

The first week she arrived in Togiak, she encountered a patient with botulism (likely from fermented beaver tail or seal oil) who almost died; a toddler in respiratory arrest having a seizure (brought directly into her living room, not the clinic); and an elderly patient in the early stages of a stroke. She treated them all successfully.

"It's a hard way of life here, but I fell in love with the people and the culture," added Frazier. "I love being in a place where I'm challenged, and where health care is truly needed."



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