

OUTLOOK

CIVIL & ENVIRONMENTAL ENGINEERING



College of Engineering
CIVIL & ENVIRONMENTAL ENGINEERING

ISSUE NO.2

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UDconnection

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LETTER FROM THE CHAIR

Welcome to the 2010–2011 Civil & Environmental Engineering (CEE) e-newsletter. As we begin the academic year, I am pleased to report that our department is growing, not only in number of faculty and students, but also in reputation.

This year we:

- **Admitted 87 new undergraduate and 25 new graduate students to our programs.**
- **Added two new faculty to the department.** Thomas Schumacher received his PhD degree from Oregon State University and joined the department as an assistant professor in September. His area of expertise is non-destructive evaluation and structural health monitoring of bridges. Julia Maresca received her PhD degree from the Pennsylvania State University and will join the department in January. Her area of expertise is environmental microbiology.
- **Created a new 4+1 program in civil and environmental engineering.** Qualified seniors can now begin to pursue a master's degree in their senior year, and complete the degree with one additional year of study. The first group of seniors admitted to the program is hard at work in graduate classes this semester.

This year has also brought national recognition to our department. A number of students were recognized for their 'Idea Leadership' by the American Society of Civil Engineers and the National Council of Examiners for Engineering and Surveying. I encourage you to read about their achievements on pages four and five.

Our Chi Epsilon students have embraced UD's concept of 'Citizen University' and are using their collective talents to make a real and significant difference in the world. Their efforts to restore wetlands in Mississippi are detailed on page five.

In addition, four new graduate students were admitted into the GAANN program, which stands for Graduate Assistance in Areas of National Need. These students will pursue Ph.D. degrees in unique interdisciplinary research and teacher education programs in the field of transportation infrastructure engineering.

Perhaps most importantly, I thank our alumni, faculty, staff and friends for their contributions this past year. It is your support that enables us to recruit outstanding faculty, enhance student activity, support research, fund graduate students and provide much needed scholarships to our students. One example is the endowment gift from Francis and Mildred Gardiner to create the Francis E. Gardiner Jr. Scholarship. The scholarship is awarded annually to academically distinguished Civil and Environmental engineering students. Gifts such as this help us meet objectives vital to instruction and the mission of our department. Your continued commitment to the department allows us to create and sustain a stimulating environment of intellectual curiosity and discovery.

As always, we are happy to hear from you. Please don't hesitate to email, call or drop me a note. To stay connected with the department, visit our website at www.ce.udel.edu or join the alumni online community at www.udconnection.com.



Sincerely,

Harry (Tripp) Shenton III
BCE '82, MCE '84
Professor and Chair

P.S. U.S. News & World Report recently ranked The University of Delaware eighth in the nation as an institution "making the most promising and innovative changes in the areas of academics, faculty, and student life."

DEPARTMENT NEWS



Senior design course nationally recognized for student engagement

UD's Department of Civil and Environmental Engineering has received top honors in a competition sponsored by the National Council of Examiners for Engineering and Surveying. The award rewards college engineering programs for engaging their students in collaborative projects with licensed professional engineers.

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DEPARTMENT NEWS



Engineering students take top honors in national geotech competition

Nine UD engineering students were awarded the prestigious Atterberg Cup for their winning scale-model design in the 2010 American Society of Civil Engineers (ASCE) Geo-Challenge Student Competition on Mechanically Stabilized Earth Wall Construction.

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Chi Epsilon students help restore wetland in Mississippi

Seven civil engineering students gained hands-on experience during a week-long wetlands restoration project in Waveland, Mississippi this year. All are seniors and members of UD's chapter of Chi Epsilon, a national civil engineering honor society.

Accompanied by Jack Puleo, an assistant professor who serves as faculty adviser to the chapter, the students -- Sarah Dalton, Sean Davis, Mike Geddis, Greg Hastings, Chance Malkin, Nathan Mayercsik and Melissa Stewart -- made structural modifications to an observation tower, removed invasive species, established a wetland trail and planted native trees.

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DEPARTMENT NEWS



Dean Michael Chajes named Delaware Engineer of the Year

Michael Chajes was recognized for his contributions to the field of engineering when he received the 2009 Engineer of the Year award at the Delaware Council of Engineering Societies (DCES) annual awards banquet in February. The honor is a testament to the profession of teaching, says Chajes, as most previous recipients were practicing engineers.

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Leshchinsky wins prestigious Kapp award

Dov Leshchinsky, CEE professor, received the 2010 Martin S. Kapp Foundation Engineering Award from the American Society of Civil Engineers (ASCE) at GeoFlorida 2010.

Leshchinsky was cited for his "innovative contribution to the unified method of design and analysis of earth retaining structures and slopes as well as the implementation of such technology through computer software and continuing education."

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DEPARTMENT NEWS

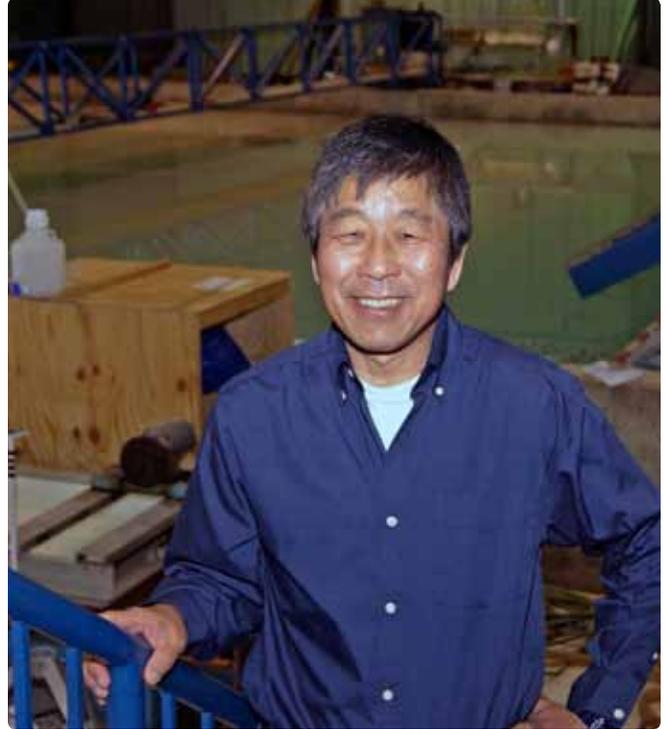


Davidson receives major disaster risk management grant, leads international professional society

Rachel Davidson, CEE associate professor, received a \$796,255 grant from the National Institute of Standards and Technology (NIST) to develop models that support the design of a regional natural disaster risk management system. The three-year project will also demonstrate application of the new models in case studies, focusing on earthquake risk in Los Angeles and hurricane risk in North Carolina.

Davidson also was elected to a three-year term as president of the Society for Risk Analysis (SRA). The society's interests include risks to human health and the environment, both built and natural, and encompass threats from physical, chemical and biological agents and from a variety of human activities as well as natural events.

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Kobayashi receives international award

CEE professor Nobuhisa Kobayashi is the recipient of the 2010 International Coastal Engineering Award from the American Society of Civil Engineers (ASCE). The award was established in 1977 to provide international recognition for outstanding leadership and development in the field of coastal engineering.

The selection committee noted Kobayashi's 30 years of outstanding contributions to research and teaching in the field, as well as his work in the creation of ASCE's Coasts, Oceans, Ports, and Rivers Institute.

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Health monitoring system being installed on new Indian River Inlet Bridge

Sussex County beach-goers and residents can easily see the progress being made on construction of the new cable-stay bridge over the Indian River Inlet. Much of the on-land work is completed, and a 200-ton form traveler will soon be recruited into service to enable construction of the section that spans the inlet itself.

But what passers-by can't see are the sensors being installed on the new bridge as part of a health monitoring system that will provide feedback about how the structure is performing during construction as well as throughout its service life.

Design and installation of the system is being carried out by a team of researchers at the University of Delaware through a \$1.1 million grant from the Delaware Department of Transportation (DelDOT).

The interdisciplinary team includes Harry (Tripp) Shenton and Michael Chajes, professors in the Department of Civil and Environmental Engineering, and Robert Hunsperger, professor in the Department of Electrical and Computer Engineering. The work is being carried out through UD's Center for Innovative Bridge Engineering.

According to UD project manager Gary Wenczel, about half of the embedded sensors have been installed. Set in the poured concrete, these sensors will provide information about the forces being carried by the bridge, as well as corrosion of the reinforcing steel, should it occur, but will not be accessible once construction is complete. Other, surface-mounted sensors are being installed on various parts of the bridge as construction proceeds.

"The challenge," Wenczel says, "will be integrating all 119 sensors into a single system where everything works together properly."

The IRIB is believed to be the first significant bridge in the U.S. to have an all-fiber-optic monitoring system designed into it from the beginning. According to Hunsperger, fiber-optic systems have a number of benefits, including immunity to noise, ease of installation, redundancy, and long-term durability.

"We hope to learn more about not only bridge behavior but also about structural health monitoring systems from this project," he says.

International conference examines water resources in a changing climate

Some 200 participants from six continents attended the Sixth International Conference on Sustainable Water Environment at the University of Delaware from July 29–31.

“Water is the most important natural resource,” said C. P. Huang, Donald C. Phillips Professor of Civil and Environmental Engineering and chair of the conference international organizing committee. “It is a necessary substance for life and there is no substitute for it. This conference is focusing on strategies and technologies for ensuring the sustainability of water resources around the world in a time of climate change.”

In his welcoming remarks, UD President Patrick Harker noted some sobering facts illustrating the urgent need for safe and sustainable water resources around the world:

- 1.1 billion people live without clean drinking water.
- 2.6 billion people lack adequate sanitation.
- 1.8 million people die every year from diarrheal diseases.
- 3,900 children die every day from water-borne diseases.
- The world’s population tripled in the 20th century, while the use of renewable water resources grew six-fold.

Paul Bishop, professor of environmental engineering at the University of Cincinnati and environmental engineering program director for the National Science Foundation (NSF), gave the first keynote address.

According to Bishop, traditional sources of freshwater -- lakes, rivers, and groundwater -- will not be enough to meet humanity’s needs in the coming decades, and we will need to develop new ways of conserving and reusing our water resources. He cited Israel, a country that reuses more than 70 percent of its water, as an example of what can be achieved with public acceptance of water reuse.

Bishop said the biggest problems faced with water reuse are pharmaceutical compounds in wastewater, the expense of replacing or adapting some urban infrastructure, and overcoming institutional barriers between water and wastewater utilities. Public perception of reused water as being poor quality can be overcome with education, he said.

Bishop pointed out that production, treatment, and distribution of water require large amounts of energy. Solving the associated problems of this interrelationship between water and energy use, which he called the “water-energy nexus,” is a national defense issue for most countries, since food production, human health, industry, and household life depend on clean and safe water and energy supplies.

A second keynote address, by Charles I. Noss, national program director for water quality of the Office of Research and Development in the U.S. Environmental Protection Agency (EPA), addressed a new safety and sustainability research program the agency is adopting.

According to Noss, the EPA’s past approach to water quality has been oriented toward risk assessment and management, often on a toxin-by-toxin basis. The new direction will be more interdisciplinary, collaborative, flexible, and transparent.

The agency’s priorities have been restructured to take action on climate change, improve air quality, assure the safety of chemicals, clean up communities, protect the nation’s waters, work for environmental justice, and build strong state and tribal partnerships.

A special issue of the *Journal of Separation and Purification Technology*, “Technology for a Sustainable Water Environment,” will be published by Elsevier, with conference chair Huang and Chip Elliott of Penn State University serving as guest editors.

The conference was sponsored by NSF, EPA, the Environmental Water Research Institute of the American Society of Civil Engineers, the Delaware Department of Natural Resources and Environmental Control, the Chinese-American Professors in Environmental Engineering and Science, and the University of Delaware’s Department of Civil and Environmental Engineering, Delaware Environmental Institute, College of Engineering, and Institute for Global Studies.

Story was adapted from an article by Beth Chajes that appeared in UDaily on August 3, 2010.

Alumni golfers tee-off to support CEE scholarships

Eighty golfers took to the green at Deerfield Golf and Tennis Club October 15th for some friendly competition in support of the Department of Civil and Environmental Engineering (CEE) Alumni Undergraduate Scholarship Awards Program.

The scholarship program currently provides academic support to four students each year, one from each class. Funds are unrestricted, allowing students to customize the scholarship to their individual needs.

"The outing is a nice way to remain connected with our alumni, while offering them a way to help recognize our top students," says Harry "Tripp" Shenton, department chair. "This year's generosity will allow us to award additional scholarships and further encourage our talented students to strive for new heights in their field of study and in their future careers."

Future goals for the program include funding other areas of need, including undergraduate research, student travel to meetings and conferences and laboratory equipment and supplies.

Top scoring teams

Competition in the day's events was fierce, with awards given for top score, closest to the pin and longest drive. The top three foursomes on the tough par-70 course were:

First Place

Anthony Aglio, Temple Carter, Todd Sammons and John Schneider; with a score of 60.

Second Place

Mike Ellis, John Eustis, Philip Horsey and Ted Januszka at 62.

Third Place

Mike Balbierer, Bill Conway, Steve Penozza and Danny Simmons (friend) in third with 64.

Congratulations also to Barry Benton and Dan Cha, winners of the closest to the pin awards and Dan Schmidt and Sondra Satterfield for the longest drive.

Our thanks to Century Engineering, McCormick Taylor, Pennoni Associates, Prime Engineering, Rummel, Klepper & Kahl, Walton Corporation and UD Senior Design for sponsoring holes at the event.

Special thanks to CEE staff assistant Marikka Beach, senior student volunteers Kate Smagala, Mindy Laybourne, Meg Mikrut, and graduate student Kelly Ambrose for their help in running the event, as well as to Kevin Hunt for donating the 50/50 prize to CEE.



2010 CEE scholarship awardees:

AMALIE KNABE, Class of 2013

JULIANNE PAGE, Class of 2012 (pictured)

CRAIG DAVIS, Class of 2011 (pictured)

SARAH DALTON, Class of 2010



Christopher Meehan appointed to national geotechnical council

CHRISTOPHER MEEHAN, CEE assistant professor, has been elected to the board of directors for the United States Universities Council on Geotechnical Education and Research (USUCGER). The organization is a consortium of faculty members from across the country that specialize in geotechnical research.

Very few people in the national community of geotechnical engineers are nominated for this high visibility position, according to department chair Harry (Tripp) Shenton III. "Chris' nomination is a positive reflection of his academic achievements and the University of Delaware's efforts to grow this sub-discipline of civil engineering," he says. Meehan is one of seven members in the nation currently on the board. His term runs from 2010-2012.

USUCGER, founded in 1985, seeks to enhance the nationwide status of geotechnical education and research at U.S. academic institutions. To that end, Meehan is currently working on collaborative efforts to bridge the gap between faculty and industry.

"This is a great forum to develop inter-university ties and collaboration," says Meehan. It also enables geotechnical researchers at the University of Delaware and across the nation to think about "the collective community, not just our separate entities."

As one of the younger members of the board, Meehan offers new insights on learning opportunities for geotechnical students at

universities across the nation. In addition, he is a role model and "important voice" for young faculty establishing themselves in a geotechnical career.

Meehan, who joined the UD faculty in 2006, earned his bachelor's degree in civil engineering from the University of New Hampshire. He earned his masters and doctoral degrees in civil engineering from Virginia Polytechnic Institute and State University (Virginia Tech). His major areas of interest are soil mechanics and soil shear behavior, slope stability, foundation engineering, soil-structure interaction, soil and site improvement, intelligent compaction, and the design of levee systems.

In 2009, Meehan received a National Science Foundation Faculty Early Career Development Award to study the seismic behavior of slickensided surfaces. His future work under the grant includes developing a student organization focused on engineering reconnaissance in the aftermath of natural disasters.

ALUMNI INTERVIEW



JOSEPH JAKUBOWSKI BCE '01 shares his perspective on civil engineering as a career and the insights he gained at UD that helped launch his career.

When did you realize you wanted to be a civil engineer in general and in geosciences/geotechnical in particular? What influenced that decision?

▶ I was drawn towards civil engineering for the same reasons many high school students are, because of an interest and ability in math and science. I wasn't 100% confident in my decision, but I figured the University of Delaware was a good fit because of both the well-regarded engineering program and the wide variety of other options in case engineering wasn't for me. As I continued my education, I was exposed to a wide variety of experiences that helped me realize my interest in geotechnical engineering and construction. My original interest in soils started when I served as a construction review technician after my freshman year.

How did your education at UD prepare you for what you're doing now?

▶ Not only did the things I learned in the classroom at UD help me professionally, but my overall college experience prepared me. I was provided with knowledge, but also given the opportunity to participate in undergraduate research, intramural and club sports, on-campus employment, and a teaching assistant position. I was also introduced to Duffield Associates during my junior year, which led to an internship before graduate school and a full-time position since earning my master's degree. Although I always looked forward to attending graduate school, I also had several options for employment that were setup through contacts I made at UD.

What is the most rewarding aspect of your job? The most challenging?

▶ Seeing a new building and knowing that I contributed to a project's successful completion is most rewarding for me. I am typically involved in the early stages, before and during the construction phase, and it is satisfying to drive past a new structure and remember how a site improved or changed from its previous condition. Most people aren't familiar with the soils or construction aspects I am involved with, so I am always excited to describe local projects I have worked on such as the Christiana Mall, Delaware Welcome Center, and several UD projects.

The most challenging part is keeping a balance, not only at work by pursuing a variety of challenges, but also maintaining a balance between the professional and personal parts of my life. The majority of my close friends are engineers, and we all struggle with finding time together.

In terms of education, students are not offered much in middle and high school that exposes them to engineering (except for the standard "I was good in math and science, so my advisor told me I should major in engineering"). What do you think can/should be done to change this (i.e., to bring engineering to K-12 students)? What role, if any, should practicing engineers play in exciting young people about engineering?

▶ It does not take much effort to spend half a day at a high school or middle school to describe some interesting, local civil engineering projects to which younger students can relate. Describing how engineers are involved from the beginning to end through presentations with pictures about soil, buildings, coastal environments, and bridges would help to promote excitement. The popularity of shows about engineering on the Discovery Channel shows that the topics we deal with on a daily basis are interesting for most people, both young and old.

Can you share a few things with us about your personal life?

▶ I am currently a Geotechnical and Construction Review project manager at Duffield Associates in Wilmington, with experience in foundation analysis, pavement recommendations, site investigations, geotechnical laboratory testing, geotechnical instrumentation, and construction testing. I am originally from New York and went to grad school at UMass Amherst after graduating UD in 2001. I returned to work at Duffield Associates in the fall of 2004 and live in Newark. I am a LEED AP, an instructor with the UD Civil Engineering Professional Engineer Review class, and involved in the Delaware Contractors' Association. When I'm not working, I am in several softball and volleyball leagues and frequent the beach.