Spotlight on Environmental Engineering

A name change, a new bachelor’s degree program, and a $2-million renovation highlight the field’s expanding role

The Civil Engineering Department at the University of Delaware began offering courses in environmental engineering in the 1970s. At first, the focus was largely on wastewater treatment. Over the years, however, environmental engineers have taken on an ever-growing array of environmental problems, from solid and hazardous waste management to air pollution control and groundwater protection and remediation. The field has clearly become more than just a subset of civil engineering. In recognition of the expanding role of environmental engineering, the civil engineering department at Delaware changed its name in 1995 to the Department of Civil and Environmental Engineering (CEE).

To go along with its new name, the department has instituted a bachelor’s degree program in environmental engineering. According to Professor Steven K. Dentel, who has been a leading force behind the new program, only about 20 universities nationwide have similar programs, and Delaware’s program is the only one for undergraduates in this area of the country.

The new curriculum began to be phased in with the first class of freshmen in the fall of 1995. Built on a strong foundation of graduate education and research, the undergraduate curriculum developed by the environmental engineering faculty is challenging. It encompasses the core civil engineering curriculum along with heavy doses of chemical and environmental engineering courses. Students in the program may elect to concentrate in either environmental facilities design and construction or pollution transport and control processes. The former is intended to add structural and geotechnical capabilities for students who anticipate working on actual design and fabrication of pollution control facilities. The latter emphasizes the chemical and biological fundamentals necessary to characterize and develop purification processes.

As Dentel points out, the new degree program is not meant to replace the existing bachelor’s degree in civil engineering.
Welcome to the premier issue of our departmental newsletter, CEE Outlook. We chose this name for our newsletter because it reflects the forward-thinking spirit that has seized the department in recent months.

Our accomplishments in the past couple of years have given us good reason to be optimistic about the future. For example, we were among the first departments in the country to establish a bachelor’s degree program in environmental engineering. Now entering its third year, the program is off to a strong start.

We have also become a recognized leader in the application of advanced composite materials for civil infrastructure renewal. With the deterioration of infrastructure as a major problem facing the nation, we have launched a research and education initiative in this area which has already received more than $3 million in financial support from the composites industry and state, regional, and federal transportation agencies.

Further evidence of our success may be found in the graph below, which shows the growth of our research expenditures over the past 10 years. Vitality in research and graduate education go hand-in-hand, and a 1995 report by the National Research Council ranked our graduate program in the top 50 nationwide, both in terms of program effectiveness and faculty quality.

A number of our faculty have also received validation of their efforts from the University of Delaware community in the form of awards, promotions, and funding for two new endowed chairs. We have welcomed four new faculty members in recent years and have appointed three more this year.

To build on the excitement generated in the department by these recent events, we held a faculty retreat in April. Our joint efforts to develop a vision and an action plan for our program’s future resulted in the following goals:

- Internships. Working together with local industries and government agencies, we plan to establish a summer internship program to provide workplace experience for undergraduate students. If your company would be interested in participating, please contact the department.

- Alumni. We value the support and success of our alumni and hope to foster an active alumni network as a resource for both alumni and current students. To join our e-mail network, see page 5.

- Curriculum. In the coming months, our faculty will be carefully reviewing our curriculum to make sure it meets the needs of emerging engineers and their employers.

- Visibility. Through a combination of innovative research and outreach, we hope to increase departmental recognition regionally, nationally, and internationally. Our new web site promises to aid us in this endeavor.

As a friend of the department, we hope you will take pride, as we do, in the continuing growth and refinement of our programs.

Dr. Chin-Pao Huang
CEE Department Chair

Unless otherwise noted, photographs appearing in this issue were taken by Robert Cohen and Jack Buxbaum, University of Delaware Photographic Services.
University of Delaware Honors Day ceremonies were held May 9, 1997. Congratulations to the following civil and environmental engineering students who received awards:

Civil Engineering Davis Award
Duane S. Duke

E. C. Davis Trust Scholarships

Delaware Asphalt and Pavement Association Scholarships
*Freshmen:* John A. Maconi, Jr., Jason P. Mullen, Daniel R. String
*Sophomore:* Francis M. Archangelo
*Junior:* Robert J. Harbeson

Delaware Section of the American Society of Civil Engineers
*Junior Award:* Robert J. Harbeson
*Senior Award:* Angela A. Ehrhart

Dept. of Civil & Environmental Engineering Alumni Award
Timothy E. Elliot

Dept. of Civil & Environmental Engineering Faculty Award
Kris C. Manning, Mark G. Zych

Duffield Associates Award
Joshua Fanelli

KCI Technologies, Inc. Award
Franklin L. Moon II

Bangalore T. Lakshman Civil Engineering Award
Eric L. Thompson

Lloyd A. Spielman Award
Tao Cheng

Tetra Tech Richardson Sophomore Award
Michael E. Miller

VanDemark and Lynch Sophomore Award
Marc D. Lipschultz

Washington Area Railway Engineers Scholarship
Jason L. Kyler, Nicole L. Levine

Woodward-Clyde Consultants Award
Holly V. Weidenaar

Alumni Association Scholarship
Mark G. Zych

Engineering Alumni Association Scholarship
Jason L. Kyler

Charles B. Evans Prize
Courtney M. Tirums

Honors Day Book Award
Jason L. Kyler

Liston A. Houston Scholarships
Jason L. Kyler, Kris C. Manning, Franklin L. Moon II

RISE Corporate Friends Award
Heather O. Upshur

After nine years as chair of the CEE Department, Ib A. Svendsen stepped down in July 1996. In recognition of his scholarship and leadership, he was named Distinguished Professor of Ocean Engineering.

Robert A. Dalrymple has been appointed Edward C. Davis Professor of Civil and Environmental Engineering. He also received the 1996 Moffatt and Nichol Harbor and Coastal Engineering Award from the American Society of Civil Engineers. He was the 19th recipient of this national honor.

In 1996, four faculty received promotions. Steven K. Dentel was promoted to Professor, while Michael J. Chajes, Ardeshir Faghri, and Victor Kaliakin were each promoted to Associate Professor with tenure.

Ardeshir Faghri received the University of Delaware’s 1995–96 Award for Excellence in Teaching. Faghri, who specializes in transportation and traffic engineering, teaches a core course in civil engineering, Systems Design and Operations, as well as several graduate-level courses. Faghri was also honored with an Excellence in Advising award in 1995. He joined the CEE faculty in 1990.
New Faculty Join the CEE Ranks

Since the fall of 1994, four new assistant professors have joined the department, one in structural and three in environmental engineering.

**Harry “Tripp” Shenton** received both his B.C.E. and M.C.E. degrees from the University of Delaware. He went on to complete a Ph.D. at Johns Hopkins University. He served several years as a research structural engineer at the National Institute of Standards and Technology (NIST) in Washington, DC, before returning to UD in the fall of 1994. His research interests include structural dynamics, wind and earthquake engineering, passive and active control of civil structures, and passive energy dissipation systems. He also specializes in structural monitoring and system identification, including long-term monitoring for performance evaluation and field monitoring of structural vibrations. Shenton teaches courses in introductory and advanced dynamics, structural dynamics design, and experimental methods in structural engineering.

**Daniel K. Cha** joined the department in the fall of 1995. He received his B.S. in agricultural and bioengineering from McGill University, his M.A.S. in bioengineering from the University of British Columbia, and his Ph.D. in civil engineering from the University of California at Berkeley. Prior to joining UD, Cha was an assistant professor at the Illinois Institute of Technology in Chicago. His research focuses on the biotransformation of environmental contaminants in natural and engineered systems and the dynamics of biological wastewater treatment processes. Cha teaches wastewater engineering, biological aspects of environmental engineering, and theory of wastewater treatment.

**Pei C. Chiu** came to the department in the fall of 1996 from Stanford University where he earned M.S. and Ph.D. degrees in environmental science and engineering. He received his B.S. in chemical engineering from National Taiwan University. Chiu’s dissertation research, which is now continuing, focused on how vitamin B-12, a co-enzyme that occurs naturally in soil bacteria, breaks down organic solvents in contaminated groundwater. He teaches the introduction to environmental engineering course in addition to environmental organic chemistry.

**Paul T. Imhoff** received his B.S. in civil and environmental engineering from the University of Cincinnati, his M.S. in CEE from the University of Wisconsin at Madison, and his Ph.D. in Civil Engineering and Operations Research from Princeton University. Prior to joining the department in January 1997, he was a research assistant professor at the University of North Carolina at Chapel Hill. Imhoff’s research involves experimental, theoretical, and computational aspects of fluid flow, contaminant transport, and reaction phenomena in soil and groundwater systems. His teaching responsibilities so far have included introduction to groundwater engineering and the environmental engineering laboratory.

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**DTI Supports Civil Engineering Research**

The Delaware Transportation Institute (DTI) is a multidisciplinary, university-wide program that was established in 1993 as a joint venture between the Delaware Department of Transportation and the University of Delaware. The DTI promotes, coordinates, and supports research, development, and educational activities to address transportation challenges and opportunities facing the state, region, and nation. In its first five years, the DTI has been the source of nearly $1.7 million in research funds for the CEE Department, supporting projects in transportation planning, traffic engineering, bridge evaluation and rehabilitation, and design of reinforced earth structures.

**Scott A. Sabol** was appointed director of the DTI in 1996. His background includes structural engineering, materials science, and research management and administration. Previously, Sabol was a Senior Program Officer with the Transportation Research Board.
Join Our Alumni E-Mail Network!

As the story above illustrates, connections with other graduates of UD’s civil and environmental engineering program can have a big impact on a career that’s just getting started or one that’s shifting gears. To facilitate connections between our alumni and between alumni and our current students, we are establishing a list of alumni e-mail addresses at our World Wide Web site. To join, simply send your name, degree, year of graduation, business address, and e-mail address to alumni@ce.udel.edu

You may also use this address to let us know about address changes (so you’ll continue to receive this newsletter and other mailings) or to share any personal or career news you’d like us to know about—we may feature you in a future newsletter!

Alumni Report:
The UD Connection at JMT

What do David Barrish, 94BCE; Joseph (Jay) Callahan, 90BCE; Stephen Carl, 75BCE; Scott Mednick, 88BCE; Laura Mehiel, 86BCE; James Renaud, 85BCE; and Michael Rothenberger, 85BCE have in common besides bachelor’s degrees in civil engineering from the University of Delaware? They all work at Johnson, Mirmiran & Thompson (JMT) in Baltimore, MD.

JMT is a multidisciplinary civil engineering and transportation design firm with offices in Richmond, VA, and York, PA, in addition to the Baltimore site. The company’s projects range from wetland replacement and traffic signal design to bridge design and sediment and erosion control. The company has a Delaware presence, not only through its employees, but also its work, which has included projects for DelDOT and the City of Wilmington. “We are pleased and proud to have such a fine group of Delaware alumni working with JMT,” says JMT president, Fred F. Mirmiran. “JMT has found the educational foundation provided by the University of Delaware to be consistently outstanding over the years.”

Although the seven engineers share an alma mater and a workplace, they are a diverse group in terms of their current responsibilities. Rothenberger and Carl are both vice presidents at JMT, while Mehiel is a senior associate, Renaud an associate, Mednick a project engineer, Barrish an engineer, and Callahan a design engineer.

These alumni work with fellow grads not only at JMT but throughout Delaware. The Odessa Bypass section of the SR-1 Relief Route was designed by Mehiel and Mednick. As a result of this contract, they have been in touch with other UD alumni who are now employed at DelDOT. Mehiel remembers her sophomore-year dorm mate Teresa Gardner Lewandowski, 86BCE, who is now involved with traffic related issues of the SR-1 project for DelDOT. David DuPlessis, 87BCE, is DelDOT’s project manager for the design and has worked closely with the JMT design team on the 3.5-mile expressway. JMT has also been working with UD grad Mark Tudor, 92BCE, of DelDOT on a transportation and environmental planning contract.

“It creates a sense of community,” Mehiel says, “Together we learned the basic engineering theories and acquired design skills. Now, each of us has a unique role in the big picture of transportation design, providing the public with an important service.”

—excerpted from a Techne article by Diane Kukich
engineering with an environmental concentration. “That option is still available for students who want more flexibility in their career or who are uncertain which area to pursue,” he says. “However, environmental engineering has become so broad that we find more courses are needed to adequately prepare students for all the types of problems they’ll encounter in their careers. Because the program is so rigorous, our graduates should be very competitive in the job market.”

The program’s first graduates will receive their degrees in 1999. At that time, Dentel expects the program will receive full accreditation by the Accreditation Board for Engineering and Technology (ABET).

There are currently about 50 students in the program, including the third freshman class due to matriculate this fall. “We have purposely kept class sizes small,” says Dentel. “Since we’re dealing with a brand new curriculum, small classes make it easier to fine tune the courses and ensure they’re taught well. And because the program is challenging, we want to maintain high admissions standards.”

Junior LaTasha Pelle agrees that the classes are challenging but says their practicality keeps them interesting. “There is a good mix of basic chemistry and practical application,” she says. She has already put her knowledge to work at two summer internships.

The implementation of the new program hinged upon a sizable financial commitment from the University of Delaware. Three new faculty in environmental engineering have been hired to help with the additional teaching load and to round out the environmental group’s expertise (see page 4).

The university has also contributed more than $2 million for a major renovation project under way in Du Pont Hall. In addition to updating the building’s sprinkler, air conditioning, and elevator systems, the renovations will include two new research laboratories and two teaching laboratories for the environmental engineering program. Two temperature-controlled rooms will facilitate microbial culture and research, while a clean room will provide a contamination-free zone for working with trace elements. Dentel expects that the renovations, which are due to be completed this fall, will benefit both the graduate and undergraduate programs in environmental engineering.

▲ Assistant professor Pei Chiu uses an anaerobic glove box to prepare samples for experiments simulating chemical reactions that take place in oxygen-free, subsurface environments.