Seven years after officially adding “Environmental” to its name, the Civil and Environmental Engineering Department has developed a robust environmental engineering educational program and become a home for high-level research. A strong environmental faculty, a refocusing of the undergraduate curriculum and investment in necessary equipment and infrastructure have enabled the department to significantly increase its laboratory research in this area. The change coincides with the University’s increased interest in sustainability, and reflects the shift toward environmental concerns in all aspects of engineering.

(continued on page 4)
This issue of CEE News highlights a number of exciting strides the department has made as a result of our group efforts.

For example, we have placed significant emphasis on environmental engineering. We have restructured our undergraduate curriculum to allow students more opportunities to specialize in this area, invested in advanced research equipment, and hired a lab technician dedicated to supporting environmental engineering research.

These achievements don’t happen in a vacuum — we’ve been able to accomplish so much as a result of the combined efforts of faculty, students and alumni. A few more examples of what those efforts have allowed us to achieve follow:

Last summer we created a new faculty-student lounge space, called Civil Commons. This space is now buzzing with activity, as a place to work on group projects and for informal discussions among students, faculty and staff. It’s been a source of great collaborations and a wonderful addition to building community within the department.

Our graduate students are doing high-level research, and we have made a concerted effort to make sure they are able to travel to the best conferences to present their work, including the American Geophysical Union conference, ASCE conferences and the American Concrete Institute conference. This gives them the opportunity to meet other students and professionals, network and make sure people see the good work we’re doing at U.Va.

As I write this, we’re preparing to host the ASCE Virginias conference, which students from around the region will attend. Our students and Professor Tom Baber have put a tremendous amount of effort into organizing this and engaging alumni to serve as judges and in other volunteer roles.

I’m grateful for the work that students, faculty, staff and alumni have done to make these achievements possible. I particularly want to recognize the support of our alumni, who are a vital part of our efforts and our success. Their contributions help us to take the core program and make it better, by adding these experiences and resources that wouldn’t be possible without their help.

In the end, we’re able to provide a much better educational experience for our students, preparing them to lead as they enter the workforce, and strengthening our research abilities and the contributions we’re making to improve civil engineering.

Best wishes,

Brian L. Smith, P.E.
Professor and Chair
Two years ago, CEE faculty settled on a new way to support undergraduates as they develop their thesis projects. CEE 4990 is a project course in which students, in small groups or one-on-one, work closely with faculty members on a major research or design experience.

In the spring of their junior year, students are presented with a range of possible projects that faculty are interested in supervising the following fall. Students then choose the projects in which they are most interested. Professor Teresa Culver, who coordinates the class, said there were 18 projects this year, with most faculty supervising groups of about four students.

The class culminates in a symposium where students present their projects and the best poster presentation is selected. Most students then use the project as the basis for their senior thesis.

Professors have a lot of leeway in determining projects to offer, Culver said. Some offer projects that complement the work their graduate students are already doing, while others use the opportunity to explore new areas of research. Some, like Culver, have found applied projects that are of interest to clients in the community.

Last fall, Culver supervised the winning team (judged by a panel of alumni and University professors), who worked on water-quality monitoring following completion of Charlottesville’s Meadow Creek Restoration Project.

The Meadow Creek restoration, run by the City of Charlottesville in conjunction with The Nature Conservancy, is one of the longer urban stream restorations in the country, Culver said. “They were doing some follow-up monitoring. Water-quality monitoring was one thing they were not doing, but were interested in, so that’s what my students chose to work on.”

Her students programmed and deployed robotic samplers to collect water samples during several storm events, then analyzed those samples back at the lab. They also used a computer model to simulate the movement of nutrients and sediments through the system under different conditions.

Rachel Boots, one of Culver’s students, said that being responsible for planning and decision making gave her and her team a sense of ownership over the project. “I think the CEE 4990 course is really valuable,” she said. “It’s one of the first times that students are put in a situation that simulates projects we will work on after graduation.”

Culver says the faculty has also been pleased with how CEE 4990 has met their goals. Previously, students would complete a major design project in the fall that would serve as the basis of their thesis, but students worked in much larger teams and all on the same project.

“Giving the students more independent choice, and working with a smaller team, was a much better fit for the thesis,” Culver said. “And I enjoyed seeing all the different projects our students are doing.”
“We’re not standing still and doing the same old thing,” said department chair Brian Smith. “We’re looking for opportunity, for ways to better prepare our students for the field.”

Roughly two years ago, the faculty decided to revise the curriculum to reflect student interest and society’s needs in sustainability and environmental issues. “I felt like we were losing out on really good students, both to other areas of the University and to other kinds of engineering,” said Assistant Professor Lisa Colosi Peterson, who has taught the first-year course Introduction to Engineering for several years. “I frequently saw very talented students who would enroll in my section of Introduction to Engineering, which has a sustainability focus, do well and then say, ‘I really want to do environmental stuff, but I don’t like engineering.’ And they would leave and go to environmental science.”

Now the department has gone from having a traditional, one-size-fits-all curriculum to having three different tracks, one of which is environmental/water resources engineering. It allows students to explore a wider range of environmental engineering courses as they complete the civil engineering program.

At the same time, the department has upgraded the environmental lab component of students’ training. Peterson’s third-year lab course, Experimental Analyses in Environmental Engineering, is now a positive for faculty and students.
“We've really invested in improving our capability to do high-level environmental engineering research. That research has a direct impact on the well-being of communities.”

— Brian Smith, Department Chair

The lab experience also enriches the department’s research capacity. “Many of the environmental faculty are doing really exciting research,” Peterson said. “It’s much more helpful for us to plug students into that research if they’ve done this lab course.”

In response to the growth, the department has created a new teaching lab that better accommodates environmental experiments. Designed with professors’ needs in mind, it has advanced research equipment and tables that can be rolled in or out as needed. This spring, it’s home to Peterson’s lab and to several teaching labs.

The department has also hired a dedicated environmental lab manager, Tony Singh, to manage the space and help students and faculty with the equipment.

“We've really invested in improving our capability to do high-level environmental engineering research,” Smith said. That research, he added, has a direct impact on the well-being of communities. For instance, Peterson is interested in understanding how to use wastewater treatment plants to make or recycle energy in a clean way. She and Assistant Professor Andres Clarens received two University grants for their work on algae biofuels, and one of their papers on the subject has been cited almost 200 times.

The opportunity to be more closely involved in such research has garnered a positive student response. “I personally have been very pleased in the past few years about the number of students who seem interested in coming here for graduate research,” Peterson said.

Among undergraduates in the department, an informal survey last year showed that more than a third self-identified as being on the environmental track, and classes like Introduction to Green Engineering and Introduction to Environmental Engineering have drawn significant interest from students in other departments.

“Increasingly, this cross-cuts into other areas of engineering,” Peterson said. “If you’re going to make or build something, you have to think about sustainability and environmental issues.”
VCTIR’S JOSE GOMEZ — CONNECTED TO CEE

“I love this university,” said Jose Gomez (’82, ’88), head of the Virginia Center for Transportation Innovation and Research (VCTIR). “I love my interactions with the U.Va. Engineering School and have since the first day I walked on these Grounds.”

That was back in 1980, when Gomez enrolled in U.Va.’s master’s program in civil engineering. He went on to earn a Ph.D. in structural engineering, then left for 10 years to teach at his undergrad alma mater, the Virginia Military Institute.

By 1992, he had achieved tenure at VMI. But when the opportunity arose to return to Charlottesville with a job at VCTIR, he jumped at the chance. “I wanted to do something different,” he explained, and he also hoped to teach at U.Va.

VCTIR, the research arm for the Virginia Department of Transportation, has a partnership with U.Va., and within a year Gomez received his first assignment as an adjunct instructor at the Engineering School. He’s been teaching here, while working at VCTIR, ever since.

During his first nine years at VCTIR, Gomez focused on bridge-related research, looking at bridge performance, field testing and modeling. In 2001, he took on a management role as associate director for structural, pavement and geotechnical engineering. And in 2011 he became the director of research, overseeing a budget of roughly $20 million and a program covering everything from materials to traditional traffic engineering to economics and policy.

Still, he has always made time for teaching in the CEE department. “It’s just something I love to do,” he said. “It’s a lot of fun to be in the classroom with these really bright kids.”

He wears a tie to every class, in honor of his own mentors, Professors Henry Kinnier and Furman Barton. “They were professional and they expected the students to act in a professional manner,” he said. “But if you needed help in any way, they were there.”

Gomez tries to serve the same mentoring role for his own students. “The U.Va. experience is the most enriching and rewarding and intellectually stimulating experience of my life,” he said.
Amir Gheitasi — GRADUATE STUDENT

Amir Gheitasi ('14) has an engineering career that began in his native Iran, where he earned a bachelor's and a master's degree in civil and structural engineering from Tehran Polytechnic. He spent two years working as a consulting engineer. While he enjoyed that, his experience in the industry ultimately set him on the path to academia.

“I liked the design process,” he said. “But I prefer the environment in universities. It’s more vivid; you have the chance to do research, collaborate with new students and contribute to the field that you are passionate about.”

Gheitasi began studying at Michigan Technological University in 2010. When his adviser, Professor Devin K. Harris, accepted a position at U.Va. in 2012, Gheitasi came with him.

Now in what he hopes is his final semester, Gheitasi is working on wrapping up his dissertation, a framework that can be used to evaluate the performance of in-service steel bridge superstructures.

“It’s a project with potential real-world implications,” said Harris. “Amir is using numerical modeling to understand how in-service bridges behave and perform in the presence of damage and deterioration, and what that means for their overall safety and redundancy. This is increasingly important to superstructures worldwide.”

Meanwhile, Gheitasi is gaining some classroom experience by teaching his own class on bridge engineering and design to graduate and senior undergraduate students. And he is waiting to hear back on several faculty and postdoc positions. “Academia is a tough field to get into, but he’s definitely well suited and well prepared,” said Harris.

Seth L. Eichenthal ('12), age 23, passed away on Jan. 1, 2014, while on vacation near Innsbruck in the Austrian Alps. His class is currently collecting contributions and making final decisions concerning a physical memorial to be located in the Engineering School. For more information, or to contribute, please contact Ali Lauzon ('12) at alilauzon@gmail.com.
JOIN THE CONVERSATION …

Send your news, milestones and address changes (mail and email) to civil-engr@virginia.edu or P.O. Box 400742, Charlottesville, VA 22904-4742.

www.cee.virginia.edu

www.facebook.com/uvacivil

www.cee.virginia.edu/linkedin

YOUR GIFTS MATTER
SUPPORT YOUR DEPARTMENT

Make a gift online to the CEE department on our secure website: http://giving.virginia.edu/engineering. If you have questions about giving to CEE, please contact Alice Baker, Senior Director of Development, at alice.baker@virginia.edu or 434.924.1332.