



The University of Texas at Austin
Civil, Architectural and
Environmental Engineering
Cockrell School of Engineering

THE **Future** OF ENVIRONMENTAL ENGINEERING

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SPRING 2017 NEWSLETTER



with Department Chair Richard Corsi

Richard L. Corsi has served as department chair since 2013 and is stepping down to focus on his research and teaching in the area of indoor air quality. We sat down with him to discuss what he has learned, what he has enjoyed and what he is going to miss most about being department chair.

What would you consider to be your greatest successes as department chair?

I am proud of several accomplishments: Advancing the department's strategic vision and plan and facilitating our early career faculty members' ownership of that vision. They are helping to push the plan forward and build it. A plan is just a plan unless faculty help with follow-through, and I am very proud that is happening.

Finalizing and adopting a master schedule for undergraduate students so that they can get the courses they need to graduate in four years.

Raising funds to renovate the third-floor spaces in our building. Now, there are more inspiring, state-of-the-art places for our students to learn, collaborate and study.

Hiring eight new faculty members. The young faculty members we have hired are inspiring teachers who infuse new ideas, tools and innovations that translate into our courses and the research we do. They help students make new connections and see across boundaries.

What have you learned after serving as department chair?

It became clear to me how amazing our staff is. They are the gears of the department; things get done because we have dedicated staff who make things happen.

I also recognized that every faculty member has different constraints and challenges and balances things in ways I could never imagine. Faculty members form a bit of a mosaic, their talents are diverse and focused. There is no 'generic faculty member.'

What are your hopes for the future of the department?

One of the things I wanted to do as department chair was to start breaking down the traditional silos, the separate areas of civil engineering. If faculty and students can work together across disciplines, they can be more creative and innovative when solving problems. The early career faculty (nearly 20 assistant and associate professors) have a really strong desire to chip away at these silos. I hope they continue to be encouraged to stay a family of cross-disciplined engineers and teachers, and I hope that, as they grow in their careers, they will keep that with them. They will ultimately be the ones that break down the silos, and I have a lot of faith that they will do this.

You have led the implementation of the department's strategic vision; how do you see this vision being implemented in the future?

The Strategic Vision Implementation Committee consists of assistant and associate professors who feel that they have a say about the future direction of the department and who feel empowered to advance our strategic plan. I would like to see this group continue to stay engaged. We should also revisit the strategic vision and treat it as a living document that evolves depending on the needs of society, faculty and students. It may be that, 10 years from now, it looks nothing like it does today.

During your time as chair, you invited students to compete in three separate team projects. Can you comment on these three annual Chair's Challenges?

I am very passionate about enhancing the undergraduate experience for students. I wanted to provide opportunities for students to be motivated, inspired and challenged to do things outside of the classroom, and that's where the Chair's Challenge comes in.

I knew that not everyone would participate but that some students would think it is a cool idea and would be excited to do something extra, to problem solve and have a friendly competition with each other. I challenged the students to produce a video about the nexus of cities, water and energy and to produce a video about why they chose to become a civil, architectural or environmental engineer, but I was most excited about this year's challenge — the design of a sustainable, resilient, healthy and aesthetically pleasing dog house. The students really got into it.

Are you eager to return to the classroom?

It is always great to be with students, and I enjoy teaching undergraduates the fundamentals of engineering. I am looking forward to getting back into the classroom and hoping to dedicate the remainder of my career to improving undergraduate education.

What is one of the best things you discovered while serving as department chair?

One of the things I have enjoyed most about being department chair is meeting alumni, whether at the university or out in the field. So many of our alumni are doing incredible things for the profession and, when they do great things and then tell people they are graduates from our department at UT Austin, it shines a big, positive light on the department. Our alumni mean a lot to our stature.

Our alumni are also so dedicated to the program and give back in many different ways. They hire our students, give financially to support our students and programs and show our students the various career paths that await them. We are so very fortunate that we have such amazing alumni.

What do you view as the department challenges for the next chair?

Collectively, our department is among the elite programs in the nation. We do great things and are capable of doing even greater things. One of the challenges for the next department chair will be how to reach that untapped potential.

I'd like to think that, 10 years from now the nation will turn to our department on a range of societal infrastructure issues and say "we need to go see what Texas thinks." We have to find ways of becoming leaders of our discipline without taxing our community, everyone has personal lives and already works very hard. How can we restructure ourselves so we don't cost people more time and resources but get to a place that is better than the great place we are at now?

Department professor and geotechnical engineer Robert Gilbert will begin his appointment as the next chair on Sept. 1, 2017.



→ Environmental engineering students work together to obtain samples from Waller Creek for a project that maps the biome of the UT Austin campus.

THE Future OF ENVIRONMENTAL ENGINEERING

LAUNCHING THE DEPARTMENT'S NEWEST UNDERGRADUATE MAJOR

As the need for a more systems-oriented evaluation of global challenges has emerged, the department recently announced a new Bachelor of Science degree in environmental engineering, which includes a multidisciplinary curriculum focused on creating solutions to environmental challenges facing the planet and protecting human health and quality of life.

The new degree takes a holistic approach to preparing the next generation of environmental engineers, allowing students to build a strong foundation in engineering and natural sciences while applying their engineering skills to environmental issues facing our society.

Beginning in the first year, students will address

local and global topics through active engagement in project- and service-based learning. Students can specialize in one of four areas: air, climate and energy; sustainable water systems; water resources and the environment; or contaminant fate and transport. The breadth of the curriculum allows students to earn 18 semester hours of approved technical coursework within the environmental engineering areas of greatest interest to them.

The application of systems-level thinking to address environmental solutions is a key paradigm of the new program. While students who enter the program will gain a broad background in engineering, mathematics and science, the multidisciplinary tracks will also allow students to take courses across other colleges and

PROGRAM Specialties

Environmental engineering students can specialize in one of the following areas:



AIR, CLIMATE AND ENERGY

- Atmospheric chemistry
- Ambient air quality monitoring and modeling
- Indoor air quality
- Air pollution control
- Climate change mitigation



SUSTAINABLE WATER SYSTEMS

- Drinking water treatment
- Municipal and industrial water systems
- Hazardous waste management and treatment
- Soil remediation
- Industrial process waters



WATER RESOURCES AND THE ENVIRONMENT

- Fluid-flow phenomena in the environment and oceans
- Surface and groundwater hydrology
- Water resources planning and management
- Groundwater modeling and management
- Flood mapping
- Design of turbines to extract the energy of ocean currents



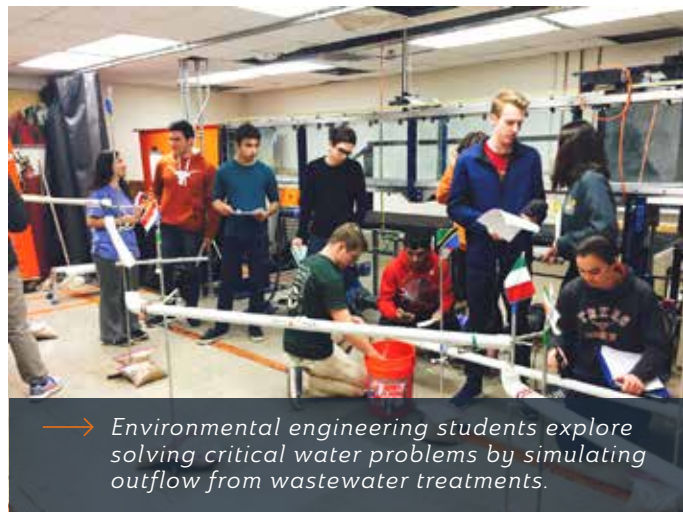
CONTAMINANT FATE AND TRANSPORT

- Water quality management
- Quality, transport and fate of pollutants in water
- Legacy pollutants, emerging contaminants and unknown environmental consequences of nanomaterials
- Modeling of chemical releases from contaminated soils

For more information about the program, visit caee.utexas.edu/environmental

schools at UT Austin and integrate their knowledge to address complex issues.

The program's first freshman class will begin in the fall semester of 2017.



→ Environmental engineering students explore solving critical water problems by simulating outflow from wastewater treatments.

CENTER FOR WATER AND THE ENVIRONMENT

In an effort to reflect the breadth of its research and outreach activities, the Center for Research in Water Resources has changed its name to the Center for Water and the Environment. From flood mapping, infrastructure modeling and measuring impacts of climate change on glacial lakes and coastal systems to the development of treatment processes for use of innovative water sources and climate change mitigation, the center has grown its research scope.

Recent and ongoing projects within the center have focused on water and wastewater treatment process development, contaminated ground and surface water remediation, contaminated sediment remediation, CO₂ sequestration, the energy/water nexus, water reuse, nanotechnology issues in water, algal biofuel production, rainwater and greywater harvesting, stormwater management and water quality in lakes, streams, estuaries, distribution systems and premise plumbing. The center is uniquely positioned to meet challenges associated with providing clean water to small water systems and cities that are both shrinking and expanding.

The center has also expanded its focus within water resources to address droughts, flooding, climate change, water resiliency and coastal systems. Our faculty, staff and students have been instrumental in revolutionizing how flooding is forecasted at a continental scale to increase resiliency. These efforts will have direct impacts on the quality of life in the state of Texas and beyond.

Alumni RECOGNITION

THREE ALUMNI ELECTED TO NATIONAL ACADEMY OF ENGINEERING

The National Academy of Engineering recently announced that three CAEE alumni have been elected to the prestigious academy. Election to the academy is among the highest professional distinctions bestowed upon an engineer, and membership honors those who have made outstanding contributions to engineering research and practice, including pioneering new and developing technologies and making major advancements in the engineering field.

SERGIO MANUEL ALCOCER

Ph.D. 1991

Sergio Alcocer is a research professor at the National Autonomous University of Mexico (UNAM) and the former undersecretary for North America in the Ministry of Foreign Affairs of Mexico. He was recognized for improvements to the seismic safety of buildings in developing countries through improved design standards and government policies. In 2001, Alcocer received the National University Distinction for Young Academics in the area of Technological Innovation and Industrial Design. In 2014, he received the Award of Distinction by the Consortium for North American Higher Education Collaboration, and in 2015, he was named a Distinguished Engineering Graduate of the Cockrell School of Engineering.

DEB A. NIEMEIER

B.S. 1982

Deb Niemeier is a professor at the University of California, Davis. She was recognized for developing groundbreaking tools to characterize the impact of transportation emissions on air quality and environmental justice. In 2015, she became the first-ever civil engineer to receive a Guggenheim Fellowship, and in 2014, she was elected fellow of the American Association for the Advancement of Science. She received the Aldo Leopold Leadership Award in 2006 and the National Science Foundation CAREER Award in 1997.

RANDALL W. POSTON

B.S. 1978, M.S. 1980, Ph.D. 1984

Randall Poston is senior principal at Pivot Engineers. He was recognized for the development of diagnostic and repair technologies for concrete structures and leadership in concrete building code development. He received the American Concrete Institute's (ACI) Henry C. Turner Medal in 2006, the ACI Henry L. Kennedy Award in 2014 and the ACI Delmar L. Bloem Distinguished Service Award in 2015, and, in 2014, he was named a Distinguished Engineering Graduate of the Cockrell School of Engineering. In 2002, Poston's Marina del Rey Seawall Rehabilitation Project was named the International Concrete Repair Institute's Project of the Year.

Alumnus Rex Tillerson Settles in as U.S. Secretary of State



Rex W. Tillerson, B.S. 1975, assumed office as the 69th U.S. Secretary of State in February 2017. In this cabinet position, Tillerson serves as the top foreign policy advisor to President Donald Trump and as the leader of the U.S. Department of State and the U.S. Foreign Service.

Tillerson was previously CEO and chairman of ExxonMobil Corp. He earned a bachelor's degree in civil engineering from UT Austin in 1975 and joined Exxon Co., U.S.A. as a production engineer that same year. He spent his entire professional career with ExxonMobil.

Tillerson serves as a member of the Cockrell School's Engineering Advisory Board, the UT Development Board and the UT System Chancellor's Council. He was named a Distinguished Engineering Graduate of the Cockrell School of Engineering in 2006 and a UT Austin Distinguished Alumnus in 2007. In 2013, he was elected to the National Academy of Engineering.



→ Back (L-R) Todd Helwig, Glenn Rix, Moo Young Han, Dan Wheat; Front (L-R) Dewayne Hahn, Valerie Briggs, Gregg Reese, Crozier Brown (Kyuichi Maruyama not pictured)

ACADEMY OF DISTINGUISHED ALUMNI CLASS OF 2016-17

The Academy of Distinguished Alumni in the Department of Civil, Architectural and Environmental Engineering was established in 2003 to recognize the professional achievements and contributions of our graduates. Academy members are leaders within their professional communities and serve as role models and mentors to our students.

VALERIE A. BRIGGS

B.S. 1997, M.S. 2000

Valerie Briggs is a visionary leader who has worked on the cutting edge of transportation research, having directed critical transitions in improving and modernizing transportation services in the United States. As the first permanent program manager for operations at the American Association of State and Highway Transportation Officials, she developed and oversaw new programs in transportation operations as well as security and emergency management.

Briggs also led the transformative change across the industry — the development of vehicle-to-vehicle and vehicle-to-infrastructure communications capabilities as part of the U.S. Department of Transportation's Intelligent Transportation Systems Joint Program Office.

In her current role as director of training for the Federal Highway Administration's National Highway Institute, Briggs provides technical training to help build skills and enhance job performance for over 40,000 members of the nation's highway transportation workforce.

J. CROZIER BROWN

B.S. 1965, M.S. 1967

Crozier Brown is a leader in the use of information technology to overcome civil and petroleum engineering challenges. He was

an early adopter of GPS, GIS and satellite imagery and learned how to apply these tools to the engineering discipline, demonstrating their value and guiding users.

For over 25 years, he has led his own consulting company, J. Crozier Brown and Associates, advising small and mid-sized engineering firms on the utilization of computer applications in all phases of a construction project's life cycle. Previously, as GIS manager at Atlantic Richfield Company, Brown introduced over 500 professionals to airborne remote sensing, data automation and both surface and subsurface data storage and analysis. He also co-authored the computer software used to design the drainage system for the 18,000-acre Dallas-Fort Worth International Airport.

DEWAYNE H. HAHN

B.S. 1973, M.S. 1974

As senior vice president of Linbeck Group LLC, Dewayne Hahn is responsible for project planning and preconstruction, coordinating and managing all design and construction resources and monitoring client satisfaction and project quality.

With over 40 years of experience in the construction industry, Hahn has embraced cutting-edge advances, including the use of technology on construction job sites, new project management and scheduling software, lean construction techniques,

BIM software, sustainable building methods and new contracting methods. Hahn has been responsible for the construction of unique structures such as the Crystal Bridges Museum of American Art, Sacred Heart Co-Cathedral, Federal Reserve Bank of Dallas - Houston Branch and Baylor University's College of Medicine. He has also mentored many young engineers and project managers.

MOO YOUNG HAN

Ph.D. 1989

A professor and director of the Rainwater Research Center at Seoul National University, Moo Young Han is a water resources engineer and technical leader who is striving to bring about a societal change in the appreciation of water's value through its careful management. A highly regarded academic, he is active in promoting and demonstrating rainwater harvesting to the public.

Han has also worked with politicians on revising laws and building practices that will require new apartment and office buildings in Seoul to capture, store and use rainwater. He also took this technology to many developing areas in Asia, creating clean drinking water for underserved communities that previously never had access. He has organized several international conferences on rainwater harvesting and is also

chair of the International Water Association Rainwater Harvesting and Management Specialist Group.

TODD A. HELWIG

B.S. 1987, M.S. 1989, Ph.D. 1994

Todd Helwig's research contributions in steel building, bridge design and structural stability have had a major impact on the structural engineering profession. A professor at The University of Texas at Austin, he is an internationally recognized authority on structural stability. Many of his novel bridge girder bracing systems have been implemented by the Texas Department of Transportation.

Helwig has also developed short courses on bracing for stability on behalf of the Structural Stability Research Council, courses that have been given to thousands of practicing engineers throughout the U.S. His research has been adopted into code provisions for building design in the American Institute of Steel Construction specification and for bridge design in the American Association of State Highway and Transportation Officials specification. Helwig is frequently sought out as a consultant, speaker and committee leader by many professional organizations and has been recognized by the American Society of Civil Engineers and the American Institute of Steel Construction.

KYUICHI MARUYAMA

Ph.D. 1979

Kyuichi Maruyama has made tremendous contributions to Japan's civil engineering sector in the fields of design, construction and maintenance management of concrete structures. He is an expert on the seismic design of concrete structures and has conducted pioneering research into continuous fiber-reinforced concrete structures using various continuous fiber reinforcement materials such as carbon and aramid fibers.

A professor emeritus at Nagaoka University of Technology, he taught for more than 35 years and also served as the university's executive director and vice president from 2003 to 2009.

Maruyama played a key role in the study of earthquake and tsunami damage caused by the 2011 East Japan earthquake and the recovery work following the event. He has also served as executive director of the Japan Society of Civil Engineers and vice president and executive director of the Japan Concrete Institute.

GREGG A. REESE

B.S. 1980, M.S. 1983

Over his 30-year career, Gregg Reese has dedicated himself to innovative projects that have improved the technology of precast bridge design and construction. He has designed numerous award-winning bridges with a new technology that uses curved, precast concrete elements for complex, long-span interchange bridge projects. He is founder, president and chief engineer of Summit Engineering Group Inc., which provides consulting engineering services to the transportation and heavy civil construction industry. Under Reese's leadership, the company has received several national bridge design awards from the Precast Concrete Institute for inventive design on light rail, flyover and interstate span projects in Colorado. He was also the construction engineer of record for the general contractor of the Margaret Hunt Hill Bridge in Dallas, helping to make the bridge, designed by architect/engineer Santiago Calatrava, possible to construct.

GLENN J. RIX

M.S. 1984, Ph.D. 1988

Glenn Rix is a senior principal and geotechnical earthquake engineering practice lead at Geosyntec Consultants. He is an internationally known geotechnical

earthquake engineering consultant, serving government and industry in the eastern and central United States.

Previously, he enjoyed a distinguished 24-year career as a professor in the School of Civil and Environmental Engineering at the Georgia Institute of Technology. Rix was a highly regarded teacher at Georgia Tech, receiving many teaching awards from the university, and was selected as the 2005 Engineer of the Year in Education by the Georgia Engineering Alliance.

Rix also served as the associate chair for finance and administration for the Georgia Tech School of Civil and Environmental Engineering, functioning as the chief operating officer for the school.

DAN L. WHEAT

Honorary Member

Throughout his 35-year career, associate professor Dan Wheat has made exceptional contributions to the success of the Department of Civil, Architectural and Environmental Engineering at The University of Texas at Austin. He served as the department's undergraduate advisor for 20 years, guiding the intellectual ambitions of thousands of students and serving as a beacon of support and encouragement during their engineering education. He also acquainted countless prospective students and their families with the department, introducing them to our program and to possible career paths in civil and architectural engineering.

Before retiring, Wheat's primary research interests were in the computational modeling of nonlinear behavior and the testing of light-frame wood structures. Through his work at the Ferguson Structural Engineering Laboratory, he developed one of the largest repositories on the empirical behavior of light-frame structural systems.

2016 Outstanding Young Alumnus



Established in 2003, the Outstanding Young Alumnus honor recognizes a graduate of the Department of Civil, Architectural and Environmental Engineering under the age of 40 who has distinguished himself or herself with outstanding service and contributions to the engineering profession and society. Recipients hold at least one degree from UT Austin.

JOHN S. McCARTNEY

Ph.D. 2007

An associate professor in the Jacobs School of Engineering at the University of California, San Diego, John McCartney is a leader in unsaturated soil mechanics, geosynthetics and foundation engineering. He has integrated these concepts to solve problems encountered in thermally active geothermal systems. He has used his experience from a study on centrifuge-scale modeling of drilled shafts used as heat exchangers to develop one of the first instrumented energy pile installations in the U.S. at the Denver Housing Authority Senior Living Center. Following this, he incorporated different types of energy piles into a new building at the U.S. Air Force Academy. He has received the prestigious J. James R. Croes Medal and the Walter L. Huber Civil Engineering Research Prize, both from the American Society of Civil Engineers.

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Sustainable DOG HOUSE Challenge

→ For the 3rd Annual Chair's Challenge, student teams designed and constructed a sustainable, healthy, resilient and attractive dog house for a 40-60-pound dog. Faculty, researchers and alumni judged the 18 participating dog houses based on eight criteria. For more, visit bit.ly/doghousechallenge