

CREATING RESILIENT, SUSTAINABLE COMMUNITIES:

INVESTING IN CIVIL & ENVIRONMENTAL ENGINEERING EDUCATION



COLLEGE OF ENGINEERING
UNIVERSITY *of* WASHINGTON



A Critical Undertaking: Building Tomorrow's Cities and Communities

The water crisis in Flint. The Oso landslide. The collapse of the I-5 Skagit River bridge.

All of these news stories demonstrate the critical need for more resilient urban systems and infrastructure. At the same time, the impact of light rail, new bridges, and the ongoing cleanup of the Duwamish River highlight the opportunities for next-generation systems to make our lives better.

At the University of Washington, Civil & Environmental Engineering students and faculty are taking on the challenges presented by our aging national infrastructure, while developing new approaches to address the needs of urban systems and communities around the globe.

Public infrastructure and resilient systems play a crucial role in enabling livable, sustainable cities, healthy environments and strong economies. It is imperative that we continue to rebuild, expand and improve our public infrastructure. This requires not just replacing the current generation of engineering professionals (which is on the brink of retirement), but increasing the number of engineers prepared with the skills and leadership abilities needed to make future urban systems better than the last.

The infrastructure solutions for making lives better both here and abroad will be developed by the next generation of civil and environmental engineers — but only with your help.





Educating the Next Generation of Engineers

UW CEE is dedicated to providing students with leading-edge technical skill development and opportunities for hands-on practice to enable them to tackle complex engineering problems in response to changing technological and societal needs. Housed in an outstanding university, UW CEE offers one of the world's premier programs in the field — ranked 14th nationally, in the top five among our public university peers, and moving up (see graph below).

From traditional bachelor's, master's and doctoral programs to online offerings and professional and certificate programs, UW CEE is preparing engineers to address infrastructure challenges in the United States and around the world by offering a broad array of specialties:

- construction engineering
- environmental engineering
- geotechnical engineering
- hydrology and hydrodynamics
- transportation engineering
- structural engineering and mechanics



The Evolution of Engineering Education

While the field's core disciplines and challenges remain consistent, materials, technologies and systems are constantly changing. In order to leverage these ongoing developments, the content, scope and mechanics of UW CEE's curricula are continually evolving to include more collaboration, active learning and increased exposure to new technologies.

Sweeping changes occurring across the engineering field include:

- Globalization: It is common for UW CEE graduates to work all over the world, necessitating cultural awareness.
- New technologies: Developments such as data sensing and two-way feedback between systems are changing the fundamentals of infrastructure systems, requiring students to utilize emerging technologies.
- Social justice and equity: It is increasingly important for engineers to consider a variety of perspectives, as well as the social consequences of their work, when developing solutions.

Faculty Expertise: Leading the Way with Cutting-Edge Research

The department's dynamic faculty reflect both a local and global mindset, and faculty-led programs continue to thrive and receive national prominence for notable advancements. These programs address critical elements included in the United Nation's sustainable development goals, adopted in 2015, which aim to protect the planet and create a more prosperous future in the next 15 years.

A number of high-profile centers based in UW CEE are testament to the department's leadership and innovative research, such as:

- **Natural Hazards Data Collection:** The collection of high-quality data in the aftermath of earthquakes and wind hazards will be used to develop more resilient infrastructure (funded by a \$4.1 million Natural Hazards Engineering Research Infrastructure grant from the National Science Foundation).
- **Air Pollution Research:** With air pollution causing more deaths per year in the United States than drug use or road injuries, researchers are working to address the nation's pressing need for better air quality (funded by a \$10 million Air, Climate and Energy grant from the Environmental Protection Agency).
- **Supply Chain and Logistics Research:** To address pressing challenges associated with delivering goods across the region, researchers are working closely with industry members Costco, Nordstrom and UPS, as well as the Seattle Department of Transportation, to test new solutions in urban goods delivery.
- **Pacific Northwest Transportation Research:** The Pacific Northwest Transportation Consortium focuses on using technological advances to develop data-driven, sustainable solutions for the diverse transportation needs of the Pacific Northwest (funded by a \$14 million grant from the U.S. Department of Transportation).
- **Freshwater Research:** The Mountains to Sea Initiative is generating new research to address key challenges facing coastal freshwater systems in the Pacific Northwest, which will be translated to national and global scales.





Our Vision: Educating More Civil Engineers to Meet Skyrocketing Demand

Civil and environmental engineers design, build, operate and maintain urban environments to improve people's lives. UW CEE's mission is to provide leadership in education, research and collaboration to move this enterprise forward.

But demand for student enrollment has surpassed UW CEE's capacity in terms of faculty and facilities. The department has added online programs to partially address the need, but we are still turning away qualified students who deserve the chance to respond to society's challenges and industry needs. While the demand for civil and environmental engineers is nationwide, the local need is also great. Washington state adds 650 new civil engineering positions per year, more than any other engineering discipline, but UW CEE graduates just 269 civil engineers (undergraduates and graduate students combined) each year.

To help meet the skyrocketing demand, UW CEE set a goal in 2010 to increase the number of undergraduate and graduate degrees awarded by 30% by 2020. The department is on pace to achieve this growth target, and available resources are being maximized, but private support is crucial.

With funding for expanded and upgraded facilities, and more faculty and staff, we can increase student enrollment and provide the leading-edge curricular enhancements and hands-on learning opportunities students need to make an impact. UW CEE's alumni and friends are key to this necessary expansion. You can help support the places, people and programs that will enable us to educate the next generation of engineers to meet our infrastructure needs.

Creating the spaces to develop tomorrow's engineers

Facility improvements and expansion are key to enrolling more students in CEE, and to providing the enhanced learning experiences students need. In short, more space will enable us to better prepare more engineers.

- Support for a new, college-wide building will enable the expansion of educational activities and project-based work for CEE students, while enhancing the opportunities for interdisciplinary collaboration.
- Upgrading the CEE instructional and laboratory spaces (such as the Structural Research Lab) in More Hall to support new educational models will allow us to maximize existing resources for the benefit of our students.





Faculty Support

UW CEE continues to hire new faculty members at a rate unseen in decades. Adding new privately funded endowed professorships and chairs is key in keeping the department competitive.

- Endowed professorships support innovative exploratory research endeavors and enable faculty to broaden their impact.
- Prestigious endowed chairs lead to growth while enabling us to recruit and retain top faculty members.

Student Support

Scholarships and fellowships are the lifeblood of student support, as professorships and chairs are to faculty. As we compete with the best universities in the country — both public and private — our ability to offer financial support provides the edge needed to attract outstanding students.

- Undergraduate scholarships generate the financial support necessary to attract and retain a diverse group of outstanding students.
- Graduate fellowships are key to recruiting top students whose contributions ensure ongoing program excellence.



Program Support

Beyond our formal educational programs, student-led activities provide real-world collaborative opportunities for students to develop their skills by taking part in competitions or providing engineering solutions to underserved communities. These student-led programs all benefit tremendously from private support, and include:

- The Concrete Canoe Team,
- Engineers Without Borders, and
- The Steel Bridge Team.

Join Us

Your investment can help UW CEE build a stronger educational community, for the benefit of our students and our society. For more information, please contact:

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Thank you for your interest in UW CEE.

BE BOUNDLESS
FOR WASHINGTON

FOR THE WORLD