



CIVIL & ENVIRONMENTAL ENGINEERING

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SOLVING CRITICAL CHALLENGES OF THE 21ST CENTURY

UW Civil & Environmental Engineering students and faculty are leading efforts to prepare for a rapidly changing world — from combating the climate crisis to designing equitable and sustainable solutions. Each day, we address our most pressing societal needs and opportunities — our Grand Challenges — through engineering.

We are committed to tackling these Grand Challenges together, through research and by equipping students to build a more climate-adaptive world through their studies and careers.

THE GRAND CHALLENGES

Designing for a changing climate: Big data, adaptive design, and other emergent concepts, theories and technologies help mitigate climate impacts, enable adaptable communities, and promote environmental justice for future generations.

Creating resilience to natural hazards: Remote sensing, machine learning, artificial intelligence and other tools build community resilience as natural disasters increase.

Engineering for socioeconomic and environmental justice: A diverse, well-trained, collaborative workforce reverses existing societal and environmental inequities and creates a more inclusive world by integrating design and engineering.

Building sustainable infrastructure: Advanced construction techniques, new materials and transformative mobility technologies create smart structures and operational strategies that withstand natural disasters and climatic events, from coastal to inland, rural to urban.

STUDENT DEMOGRAPHICS

UNDERGRADUATE EDUCATION 2023-2024

313 students enrolled

119 B.S. CE, 15 B.S. EnvE degrees awarded

26% transfer students

6% international students

16% underrepresented minorities

43% female students

GRADUATE EDUCATION 2023-2024

335 students enrolled

133 M.S., 19 Ph.D. degrees awarded

24% international students

11% underrepresented minorities

33% online students

42% female students

OUR STUDENTS

DEGREE PROGRAMS

Bachelor's degrees

- **Bachelor of Science in Civil Engineering (B.S. CE)** — Provides a big-picture perspective of civil and environmental engineering.
- **Bachelor of Science in Environmental Engineering (B.S. EnvE)** — More science-focused to meet an increasing demand for environmental engineers.

Master's degrees

On-campus programs are offered in six specialty areas with thesis and coursework-based Professional Master's Program options.

Online master's degrees

Four programs offer flexible schedules: Supply Chain Transportation and Logistics, Sustainable Transportation, Construction Engineering and Energy Infrastructure.

Ph.D. program

Intensive research prepares students for advanced professional careers in academia and industry.

STUDENT EXCELLENCE

College of Engineering Dean's Medal for undergraduate academic excellence (2019)

4 NASA Fellows (2019-2020)

2 EERI/FEMA NEHRP Graduate Fellowships (2019-2020)

11 NSF Graduate Research Fellows (2019-2020)

EDUCATIONAL PROGRAM SPECIALTY AREAS

Environmental Engineering - Protecting and preserving the environment through water quality research, air pollution control, wastewater management and more.

Hydrology & Hydrodynamics - Hydrology research focuses on the quality and distribution of surface water, groundwater and water management in urban and rural environments. Hydrodynamics explores the properties of fluids in motion.

Structural Engineering & Mechanics - Focusing on evaluating the structural integrity of built structures such as buildings and bridges. Structural engineers also design more resilient structures to withstand hazards such as earthquakes and tsunamis.

Transportation Engineering - Solving transportation problems affecting all modes of travel, with a focus on intelligent transportation systems, multi-modal transportation and freight and logistics.

Construction, Energy and Sustainable Infrastructure - Evaluating the design and construction of infrastructure, from roadways to buildings around the globe. Construction engineers specialize in construction materials, sustainability and quality control.

Geotechnical Engineering - Using new technologies to study the behavior of earth materials, with a focus on geotechnical earthquake engineering, landslides, soil mechanics, foundation engineering and reinforced soil systems.

STUDENTS IN THE SPOTLIGHT

CEE is dedicated to providing students with leading-edge technical skill development and opportunities for hands-on practice, preparing them to solve the complex engineering problems of the future.

UW Steel Bridge team: This adept group of students combines skill and teamwork to design and construct a 20-foot scale-model steel bridge in the American Society of Civil Engineers' Steel Bridge competition, where they compete with teams from colleges across the country.



Community impact: Ph.D. student Dan McCabe combines his love for cycling with his expertise in civil and environmental engineering to optimize bicycle-powered grocery deliveries, enhancing food bank services for those facing food insecurity.



STRATEGIC RESEARCH INITIATIVES

TRANSPORTATION

- Autonomous and electric vehicles: Advancing emerging transportation technologies and systems.
- Freight and logistics: Connecting industry, transportation agencies and policy makers.
- Transportation infrastructure: Developing data-driven, sustainable solutions to transportation needs in the Pacific Northwest and urban areas around the world.
- Sustainable roadways: Implementing sustainability performance metrics for roadway design.

COMMUNITY RESILIENCE

- Earthquake engineering: Analyzing and developing innovative structural systems, and improving understanding of ground motions and soil behavior.
- Tsunami hazards: Developing new structural systems that can withstand powerful waves.
- Floods and landslide risk: Developing new tools to track sediment from landslides and other debris, which can contribute to or cause flooding.
- Natural hazards reconnaissance: Collecting, assessing and archiving high-quality perishable data in the aftermath of natural disasters.

GLOBAL ENGINEERING

- Supporting vulnerable populations around the globe: Removing arsenic from drinking water, forecasting the availability of irrigation water, improving indoor air quality and enhancing refugee camp infrastructure.

HEALTH AND ENVIRONMENT

- Water quality: Minimizing the impacts of contaminants on humans and sensitive environments and improving wastewater treatment methods.
- Air resources: Assessing the origins of pollutants and developing innovative ways of removing airborne contaminants.
- Healthy buildings: Improving the sustainability of infrastructure by designing healthy indoor office spaces.

CLIMATE CHANGE

- Coastal region management: Supporting better management of vulnerable coastal regions, which are threatened by sea level rise and other climate change factors.
- Environmental impacts: Investigating the causes and impacts of climate change by studying receding glaciers and collecting weather and ocean data.

FACULTY

43 Core Faculty

13 Adjunct Faculty

77 Affiliate Faculty

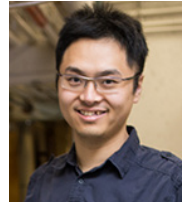
CEE CENTERS

- **Pacific Northwest Transportation Consortium (PacTrans):** Administered by the U.S. Department of Transportation, headquarters transportation research and education in the Pacific Northwest.
- **Supply Chain Transportation and Logistics (SCTL) Center:** Serving industry, transportation infrastructure agencies and policy makers, research is conducted on urban goods delivery.
- **Natural Hazards Reconnaissance Facility (RAPID):** Enables the collection, assessment and archiving of data in the aftermath of disasters, to develop more resilient communities.
- **Freshwater Initiative:** Promotes innovative research in the water science and engineering communities to address complex freshwater issues both locally and around the globe.
- **Washington State Transportation Center (TRAC):** An interdisciplinary transportation research agency that links government agencies, university researchers and the private sector.
- **Computing for the Environment Initiative (CS4Env):** An interdisciplinary initiative that uses advanced technologies, methodologies and computing resources to accelerate research related to climate change, pollution, biodiversity and more.
- **Northwestern Tribal Technical Assistance Program (NW TTAP) Center:** NW TTAP serves as a go-to local resource for Tribal transportation training, technical assistance and technology transfer needs. interdisciplinary transportation research agency that

ALUMNI IN THE SPOTLIGHT



Marc Edwards (MSCE '88, Ph.D. '90) is a nationally recognized expert on water quality. A professor at Virginia Tech, he was named one of the world's most 100 influential people by *Time Magazine* for his work to uncover lead poisoning during the Flint water crisis.



Nathan Cai (Ph.D. '11) cofounded a startup, MicroHAOPS with professor emeritus Mark Benjamin. Their technology increases the rate at which water purification processes produce clean drinking water, helping address the global water crisis.



Heta Kosonen (Ph.D. '18) is a project manager at the UNICEF product innovation center in Copenhagen. She is increasing children's access to life-saving commodities by driving research and development for new products and scaling up proven product innovations.



Kari Watkins (Ph.D. '11) is an associate professor of civil and environmental engineering at Georgia Tech. While at UW, Watkins co-created OneBusAway to provide real-time transit information. Her work uses technology in transportation planning and operations.



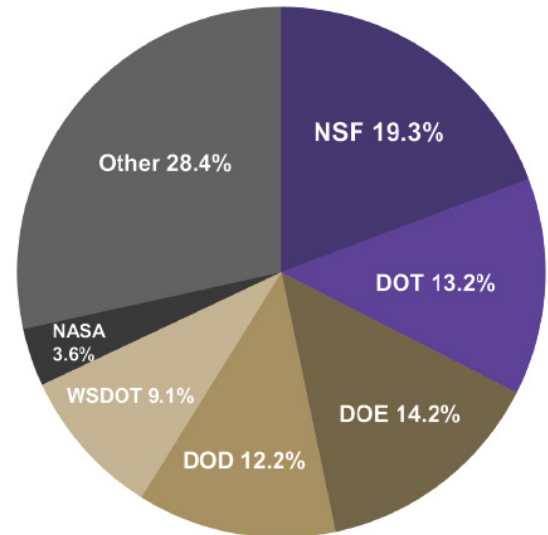
Geoffrey Morgan (BSCE '11) is an infrastructure sustainability and resilience specialist for the United Nation's Office for Project Services, where he is developing plans to build and manage sustainable, resilient infrastructure. In recognition of his efforts, Morgan was named a Young Engineering Laureate by the World Federation of Engineering Organizations.



Amy Haugerud (BSCE '77) is the founder of RoseWater Engineering and was named "Engineer of the Year" by the American Council of Engineering Companies-Washington chapter. She joined forces with two fellow alumnae, Anne Symonds, (BSCE '75, MSCE '78), and Kristen Betty, (BSCE '83), to establish the Women Business Founders' Endowed Scholarship Fund in Civil & Environmental Engineering.

RESEARCH FUNDING IN UW CEE, FY23

Source	Amount
National Science Foundation (NSF)	\$ 3.8 million
U.S. Department of Transportation (DOT)	\$ 2.6 million
U.S. Department of Energy (DOE)	\$ 2.8 million
U.S. Department of Defense (DOD)	\$ 2.4 million
Washington State Department of Transportation (WSDOT)	\$ 1.8 million
National Aeronautics and Space Administration (NASA)	\$ 700,000
Other	\$ 5.6 million
Grand Total	\$ 19.7 million



"Through innovative teaching and research, UW CEE develops future engineers ready to create transformative solutions for the world's most pressing challenges. From sustainable infrastructure to environmental stewardship, our students and faculty are committed to pioneering solutions, fostering cross-disciplinary collaborations, and ensuring a brighter, more sustainable future for all." -Bart Nijssen, Professor and Chair

