



# SPECIALTY AREA: STRUCTURAL ENGINEERING & MECHANICS

## RESEARCH TOPICS

- Reinforced and Prestressed
  - Concrete Structures
  - Steel and Composite Structures
- Earthquake Engineering
- Tsunami Engineering
- Accelerated Bridge Construction
- Advanced Numerical Simulation and Computational Mechanics
- Aerospace Structures

## DEGREE PROGRAMS

- Master's Programs:
  - Research-intensive academic track
  - Coursework-only professional track
- Ph.D. Program

## OVERVIEW

UW CEE structural engineers perform innovative research across a wide range of topics using experimental, numerical and analytical techniques. The diverse expertise of the structural engineering research group provides unique opportunities for research. Current research projects are aimed at improving the resiliency of structures against earthquake, tsunami and wind hazards; creating more durable materials; modeling, evaluation and design of reinforced concrete, prestressed concrete, steel, timber and composite structures; improving the sustainability of structures and designs for rapidly constructed structures; enhanced structural systems for marine and aerospace environments; and developing computational mechanics tools for numerical modeling of complex physical phenomena, including the structural behavior of turbine blades as they interact with the surrounding fluid media. Faculty are closely engaged with the professional engineering community and their research is consequently implemented in practice.

## CAREERS

Many structural engineering employers believe it is essential that new hires have graduate degrees, with a master's degree required for many exciting and challenging jobs in the field. Graduates are well-prepared for careers in structural analysis and design, multi-disciplinary engineering, government research and more. Recent graduates are highly competitive in the job market across the country, as well as the local job market in Seattle that provides excellent employment opportunities.

## Best Graduate Schools

UW CEE received the following rankings from *U.S. News & World Report* for 2018:

**#12** best graduate school in environmental engineering

**#16** best graduate school in civil engineering

## EXCELLENCE IN TEACHING

The structural engineering faculty members hold teaching to be an important part of their work, and have a long record of excellence in teaching. Two faculty hold University Distinguished Teaching Awards, another has won the Departmental Teaching Award more frequently than anyone else, and two more have recently achieved “perfect” teaching ratings from their classes.

## CENTERS

Centers headquarter research on specific themes and act as hubs connecting faculty and students with resources to support research, education and outreach activities. Researchers are affiliated with the following centers:

- Natural Hazard Engineering Research Infrastructure (NHERI) Rapid Experimental Facility (led by UW CEE)
- Pacific Northwest Transportation Consortium (led by UW CEE)
- FHWA Accelerated Bridge Construction Center (led by Florida International University)

## RESEARCH FUNDING

UW CEE structural engineering and mechanics research is supported by a wide range of funding agencies including the National Science Foundation, Federal Highway Administration, National Cooperative Highway Research Program, various state departments of transportation, U.S. Air Force and foundations.

## STUDENT RESEARCH



### Attaching Light Rail to a Floating Bridge

Light rail will cross a floating bridge for the first time in the world when construction is completed on Sound Transit's East Link Extension Project in 2023. The engineering feat is possible thanks to a team of researchers, including master's student Kristina Tsvetanova (shown here) and former students Travis Thonstad and Matthew Sisley, who are collaborating with consultants to test various features of the system, which has never before been implemented. Since not a single hole is allowed on the bridge deck, engineers developed a solution to connect light rail tracks to the bridge without the use of traditional methods such as bolts. Tsvetanova is leading the team conducting tests on the final prototype, which consists of a complex “sandwich” of different materials to connect the rails to the bridge deck.



### Sustainable Earthquake Resilient Buildings

Building high-rises that are both earthquake resilient and sustainable is the goal of a team of researchers from across the country, including master's student Sarah Wichman. The researchers paired a new type of sustainable building material with a rocking wall system, which allows walls to rock back and forth during an earthquake. The rocking wall concept, now quite widely copied throughout the industry, was originally developed at the UW in the 1990s. During a large-scale test of the system, Wichman oversaw the installation and testing of the rocking walls. The researchers found no significant damage to a two-story prototype after 14 earthquake simulations. The research may one day inform the next generation of buildings constructed in earthquake zones.

## FACULTY

Jeff Berman	Helnwein
Paolo Calvi	Gregory Miller
Marc Eberhard	Michael Motley
Dawn Lehman	Charles Roeder
Laura Lowes	John Stanton
Peter Mackenzie-	Richard Wiebe



**CIVIL & ENVIRONMENTAL ENGINEERING**  
UNIVERSITY of WASHINGTON

**CONTACT US**  
ceinfo@uw.edu  
ce.uw.edu