

# Undergraduate Program in **CIVIL ENGINEERING**

## **Civil Engineers Shape the World**

Civil engineers build societies, from the landmarks that define who we are to the critical infrastructure essential to our quality of life. Projects such as the Hoover Dam, the Tappan Zee Bridge, Boston's 'Big Dig,' the interstate highway system, and New York City's water supply system illustrate the diversity, scale, grandeur, and functionality that is civil engineering. Because they often work in the public arena, civil engineers require broad technical training as well as strong communication skills, and usually must be licensed as professional engineers.

## **Careers for Civil Engineering Grads**

According to the U.S. Bureau of Labor Statistics, employment for civil engineers is projected to increase by 6% through 2028. Graduates may choose from a broad spectrum of opportunities in industry, governmental agencies, private consulting firms, and construction companies, as well as in research and development. Many graduates return to school to pursue advanced degrees, including the MS in Civil Engineering. A few go on to complete their PhD and obtain positions in academia.



## **Curriculum Overview**

The BS degree in Civil Engineering is accredited by the Engineering Commission of ABET (abet.org) and prepares students for graduate study and/or professional practice.

### [ FRESHMAN-SOPHOMORE ]

The first two years of study build the basic science and mathematics skills needed for the practice of civil engineering: physics, chemistry, earth science (geology), math through calculus and differential equations, mechanics of rigid and deformable bodies, materials, graphics, CAD, BIM, and computer programming. These courses give a solid foundation in problem solving and analytical thinking, which are essential for civil engineering students.

### [ JUNIOR ]

The third year builds on the basic science courses and provides two-class sequences in each of the following sub-disciplines of civil engineering: structural engineering, geotechnical engineering, water resources engineering, transportation engineering, and environmental engineering. Hands-on laboratories build practical skills from the classroom instruction.

## **Facts About CSEE@UB**

- Ladder faculty: 35
- Typical CSEE class size: 30-120
- 35,000 square feet of teaching and research labs
- Over \$2 million in annual research expenditures
- National average starting salary: **~\$60,000**
- Over 3,500 alumni worldwide

## **Degrees offered:**

- BS in Civil Engineering
- BS in Environmental Engineering
- A 5-year combined BS Civil Engineering/MBA
- MS in Civil Engineering
- MS in Environmental Engineering
- PhD in Civil Engineering

### [ SENIOR ]

With the background acquired in the junior year, students are equipped to take design classes and to engage in the professional practice/capstone design sequence. Students can pursue a specialization track by choosing relevant technical electives in one of the sub-disciplines introduced in the junior year.

### [ BS CIVIL ENGINEERING/ MBA STUDENTS ]

Students in the joint BS Civil Engineering/MBA program will take primarily business classes in the senior year, and complete their professional practice/capstone design sequence in the fifth year of study.

## **Did You Know?**

UB offers a number of opportunities to students who want to continue their academic career beyond a bachelor's degree. The Department offers several concentrations in its civil engineering MS and PhD programs, including: structural and earthquake engineering, bridge engineering, computational engineering mechanics, geomechanics and geotechnical engineering, and transportation systems engineering. Many of our graduates choose to continue their studies at UB or attend other top tier universities, such as MIT, Purdue, Carnegie Mellon, UC Berkeley, UT Austin and Texas A&M.

## Learning by Experience

The School of Engineering and Applied Sciences places significant emphasis on experiential learning, the goal of which is to offer students a greater understanding of their options as they decide on their post-UB careers, and increase their preparedness for entering the engineering profession. Experiential learning initiatives include internships, engineering intramurals, job shadowing, and senior capstone design projects.



## Undergraduate Research

Undergraduate students in civil engineering can gain research experience under the mentorship of our faculty members. Participating in undergraduate research provides students with an inquiry-based learning opportunity and engages them as active learners in a laboratory setting.

## Student Excellence



**Wakil Pranto** is a senior civil engineering student, and chose UB for its “never-ending opportunities: its nationally ranked engineering program, the affordable price tag for an excellent education and its renowned Student Association.” During his time at UB he has served as both the Vice President and Community Service Chair for UB’s student chapter of the American Society of Civil Engineers. Wakil has also interned with HDR, North Railroad and Kiewit. Wakil was also selected as one of the American Society of Civil Engineers’ “10 New Faces of Civil Engineering” in the college category.

## World-Class Faculty



Assistant professor **Negar Elhami-Khorasani’s** research topics include structural fire engineering; probabilistic performance-based design, resilient communities; and cascading multi-hazard analysis. Her work on a Digitized fuel load surveying methodology using machine vision was funded by the National Fire Protection Association, and developed a new data collection methodology to harness recent developments in mobile electronic devices, cloud storage and machine vision to efficiently complete fuel load surveys in buildings. Fuel load quantifies the amount of energy available in a room to fuel a fire.

Elhami-Khorasani was also recognized by the American Institute of Steel Construction with the Early Career Faculty Award in 2020 for her “demonstrated promise in the area of structural steel research.

## Student Clubs and Activities

Our students are engaged in a variety of campus-wide activities and organizations. Some of the more popular clubs for civil engineering students include the student chapter of the American Society of Civil Engineers, featuring the annual AISC Steel Bridge and ASCE Concrete Canoe design teams, and Engineers for a Sustainable World.

UB’s Steel Bridge team was fourth nationally in 2019! Involvement in these clubs enriches the academic experience and provides students with strong leadership opportunities, along with some great memories.



To apply, please visit [admissions.buffalo.edu](https://admissions.buffalo.edu)

## Successful Alumni



**Ariana Fay** (BS 2018, MS 2019) earned both her BS and MS from UB. She initially joined the civil engineering program because of her interest in

transportation. However, at the end of her junior year, Ariana secured an internship at the Turner-Fairbank Research Center. During the internship, Ariana worked on an innovative deck-to-girder connect using ultra high-performance concrete. As a result of this work, Ariana developed a passion for structural and bridge engineering. She was also able to attend the Accelerated Bridge Construction Conference in Miami, Florida to present her findings. Over the course of her academic and professional career, Ariana has also worked with Ryan Biggs Clark Davis Engineering & Surveying, the Federal Highway Administration and the NYS Department of Transportation



**Michael Marino** (BS, 1996) is the CEO at Nussbaumer & Clarke, Inc., a multi-disciplinary engineering and land surveying firm with offices located throughout

Western New York. He has been with the company for two years in an ownership role, and provides oversight on a number of the company’s larger projects. During his final semester, Marino participated in two UB programs that would eventually help jumpstart his career. He became co-captain of the UB ASCE concrete canoe team, and was hired by a local engineering firm after signing up for the university’s internship program. Marino still utilizes the connections and skills he earned while enrolled at UB in his career.

## CONTACT INFO

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