

Professional Master's Degree **Global Engineering**

Be change. Be impactful. Be visionary.



Mortenson Center in Global Engineering
UNIVERSITY OF COLORADO BOULDER

Grow your expertise. Advance your career.

Advance your career by earning a Professional Master's in Global Engineering or a Professional Master's in Global Environmental Engineering at the Mortenson Center in Global Engineering (MCGE). In these degrees, students engage with global development issues within the framework of an engineering degree program. You will gain expertise in identifying and leveraging the technical and social aspects of development to achieve sustainable solutions.

Global engineers work to understand and address the unequal and unjust distribution of access to basic services and envision a world where everyone has safe water, sanitation, energy, food, shelter and infrastructure and can live in health, dignity and prosperity. As an engineer, you can contribute to a more just and equitable world. Engineers must become activists and advocates, leveraging their professional skills and capacity to generate evidence and positive impact toward rectifying global inequalities.

The Mortenson Center combines education, research and partnerships, training engineers to recognize the issues at the core of development challenges. Our mission is to positively impact vulnerable people and their environment by improving development tools and practice. MCGE faculty, students and staff work together toward our shared vision of a world where everyone has safe water, sanitation, energy, food, shelter and infrastructure.

The Professional Master's in Global Engineering is a professional track of the MS in Civil Engineering. This degree offers students exposure to a breadth of knowledge in relevant areas such as global health, development economics, and impact evaluation. It builds technical skills and provides the opportunity for further study in a specific area of interest within Global Engineering.

The Professional Master's in Global Environmental Engineering is a collaborative program between the Mortenson Center and the Environmental Engineering Program. This degree is designed for the student's pursuit of greater technical depth in Environmental Engineering while engaging in Global Engineering coursework and the practicum. In addition to classroom-based learning, students are required to complete a practicum, working for six weeks to six months within a host organization.*

Be at the forefront of this burgeoning field with a degree from a top-ranked engineering department at a university that boasts a long history of engineering in development contexts.

**Practicum placements have historically emphasized in-person work with international organizations. Recently, the program has been adapted to allow for remote contribution and U.S.-based host organizations, as needed.*

Admission

Requirements

- ▶ Cumulative GPA of 3.00
- ▶ Completion of a four-year bachelor's degree
- ▶ Proof of English proficiency
- ▶ Math (4 semesters) including Calculus, Linear Algebra and Differential Equations
- ▶ Physics (2 semesters)
- ▶ Analytical Mechanics (1 semester)
- ▶ Fluid Mechanics (1 semester)
- ▶ Completion of the enrollment form

Up to 9 hours of relevant graduate-level coursework may be transferred to meet the course requirements for the MS degree, following the rules established by the Graduate School for transfer credit.

You may be admitted with three or fewer deficiencies, but the missing undergraduate-level coursework must be completed as early as possible in your graduate career.

Completion: Global Engineering

The Professional Master's in Global Engineering requires 30 credit hours of graduate-level courses. These requirements are met through MCGE core courses, Global Engineering Series, and approved electives.

Grow your expertise. Advance your career.

Core Courses

- ▶ CVEN 5919: Global Development for Engineers (3 credits)
- ▶ CVEN 5939: Global Development Field Practicum (3 credits)

Global Engineering Series

In the Professional Master's in Global Engineering, you are required to complete 12 credit-hours from the Global Engineering series. Courses are offered as 5-week modules, with each module worth 1 credit-hour. You will work with your faculty advisor to determine which of the following modules to take:

- ▶ **Principles**
Introduction to Development Economics for Engineers
Introduction to Global Health for Engineers
- ▶ **Project Management**
Program and Project Management
Solution Identification and Proposal Development
- ▶ **Field Methods**
Community Appraisal
Study Design and Impact Evaluation
Data Collection and Analysis Tools
- ▶ **Humanitarian Aid**
Introduction to Humanitarian Aid
Disaster Risk Reduction
Refugees & Displacement
- ▶ **Water, Sanitation and Hygiene (WASH)**
Drinking Water
Sanitation and Hygiene
Water Quality Lab
- ▶ **Household Energy**
Household Energy Use and the Services Provided
Combustion of Solid Fuels
Heat Energy Conversion Technology

Electives

You will work with your faculty advisor to determine which courses to take in order to fulfill the remaining 12 required credits.

Completion: Global Environmental Engineering

The Professional Master's in Global Environmental Engineering is a 30-credit program that includes 15 credits focused on Global Engineering.

Core Courses (3 credit hours each)

- ▶ CVEN 5464: Environmental Engineering Processes
- ▶ CVEN 5404: Water Chemistry or CHEM 5151: Atmospheric Chemistry
- ▶ CVEN 5484: Environmental Microbiology
- ▶ CVEN 5919: Global Development for Engineers
- ▶ CVEN 5939: Global Development Practicum

Option Areas

You will work with your faculty advisor to make decisions regarding the following:

- ▶ Choose 3 credits from Water Sanitation and Hygiene (WASH) or Household Energy in the Global Engineering Series
- ▶ Choose 6 additional credits from the Global Engineering Series
- ▶ Choose one course (3 credit hours each):
 - ▶ CVEN 5524 Water Treatment
 - ▶ CVEN 5534 Wastewater Treatment
 - ▶ CVEN 5474 Hazardous Waste Management
 - ▶ CVEN 5554 Fundamentals of Air Quality Management
- ▶ MCEN 5131 Air Pollution Control
- ▶ Elective: Elective courses will be determined in consultation with your faculty advisor.

The MCGE program is unique within the Western region of the United States and offers residents of eligible and participating Western Interstate Commission for Higher Education (WICHE) states a tuition benefit via the Western Regional Graduate Program (WRGP). For more information about the WICHE WRGP, please see wiche.edu/wrgp.

Graduate education that works the way you do.

Real focus. You will be part of a community of students learning to improve global development tools and practice.

Real relationships. Student practicum placements are with our well-established partners in governmental and non-governmental organizations, consulting firms and the private sector often resulting in long-term relationships.

Real-world experience. Our students have completed practicums in over 50 countries with more than 80 host organizations.

Real research. Themes include sustainable WASH systems; in-situ and remote sensing; indoor air quality; infrastructure resilience and disaster recovery; drinking water testing, treatment and adoption; engineering education.



Value to you.

Competitive. Our faculty are esteemed engineers and practitioners with knowledge that expands beyond the theoretical including real-world experience in global development.

Compelling. Leverage your professional skills and capacity to generate evidence and positive impact toward rectifying inequalities.

Comprehension. Gain foundational knowledge and exposure to real-world problems.

Collaborative. Students can work alongside faculty conducting diverse research projects.

Contribute. To a more just and equitable world.

Get Started

Visit: colorado.edu/center/mortenson/

Email: laura.a.macdonald@colorado.edu



Mortenson Center in Global Engineering
UNIVERSITY OF COLORADO BOULDER