

# HUMANITARIAN ENGINEERING | MS, Certificate



The Mines Humanitarian Engineering and Science (HES) graduate program educates technical professionals to promote sustainable community development. It stands out by drawing on a unique mixture of faculty expertise in engineering, applied sciences, and social sciences. HES students engage in direct research and outreach within and alongside the communities they seek to serve. Project experiences prepare graduates for careers in development, corporate responsibility, or further study.

## HUMANITARIAN ENGINEERING AND SCIENCE: GEOPHYSICS

Broadly defined, Humanitarian Geophysics focuses on applying the principles of geophysics to improve the lives of disadvantaged communities and the natural environments in which they live. Humanitarian Geophysics spans a wide range of topics including

- Locating new groundwater resources
- Groundwater/aquifer management
- Environmental remediation and monitoring
- Natural hazards posed by earthquakes, volcanoes and landslides
- Agriculture development, management and optimization
- Securing cultural heritage

Practitioners work to develop sustainable socio-technical solutions to these challenges in collaboration with local scientists, communities and government stakeholders.



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## DEGREE OPTIONS

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**Master of Science (thesis based):** 30 credit hours, comprised of 24 credit hours of coursework in both humanitarian engineering and geophysics, plus a minimum of 6 credit hours of Humanitarian Geophysics thesis research.

**Master of Science (non-thesis):** 30 credit hours of coursework in both humanitarian engineering and geophysics.

**Graduate Certificate:** 12 credit hours of coursework focused exclusively on humanitarian engineering theoretical foundations and practical applications.

## CORE COURSES

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- Engineering and Sustainable Community Development
- Community-Based Research
- Risks in Humanitarian Engineering and Science
- Humanitarian Engineering and Science Capstone Practicum

## GEOPHYSICS TRACK COURSES

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- Humanitarian Geoscience
- Geophysical Data Integration and Geostatistics
- Applications of Satellite Remote Sensing
- Groundwater Geophysics

## APPLICATION INFORMATION

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- **Background in geosciences or related quantitative field required for HES: Geophysics degree.**
- Statement of purpose, updated curriculum vitae or resume and transcripts for post-secondary degrees are required for all students.
- Three letters of recommendation are required for students pursuing the MS thesis option.
- Non-native English speakers must meet one of the following minimum requirements: TOEFL iBT score of 79; TOEFL paper-based test score of 550; TOEFL computer-based test score of 213; IELTS score of 6.5 or have received a prior degree from an English-speaking university.
- Mines undergraduate students may count up to six credits from their undergraduate program toward a combined BS/MS degree. External applicants may substitute approved electives with courses brought from elsewhere with written permission from the HES program director.

**DOMESTIC APPLICATION DEADLINE: July 1 (Fall)**

**TO LEARN MORE, VISIT:** [mines.edu/gradprograms/edns](https://mines.edu/gradprograms/edns) or contact [humanitarian@mines.edu](mailto:humanitarian@mines.edu)

