The Mines earth resources development engineering specialty is for those who wish to specialize in interdisciplinary fields that include understanding emerging technical and social issues in earth resources development engineering. Because of the interdisciplinary nature of this degree program, students will be required to take three core classes in the Mining Engineering Department, then will choose courses related to their area of interest offered by mining, as well as other departments across campus.

**DEGREE OPTIONS**

- **Doctor of Philosophy**: 72 credit hours, comprised of 48 credit hours of coursework and 24 credit hours of research. Students must also complete written and oral qualifying exams, present a thesis-research proposal and defend their thesis before the thesis committee.

- **Master of Science (thesis based)**: 30 credit hours, comprised of at least 21 credit hours of coursework and 9 credit hours of research.

- **Master of Science (non-thesis)**: 30 credit hours of coursework, with a minimum of 15 credit hours from within the Mining Engineering Department.
SUBJECT AREAS

- Mining and sustainability
- Mine closure and reclamation engineering
- Corporate social responsibility
- Artisanal and small-scale mining
- Underground construction and tunneling engineering
- Mining and the environment
- Modeling and design in earth systems and processes
- Geothermal
- Explosive engineering
- Mine and construction management
- Mining-related data science
- Earth observation for mine environmental monitoring
- Internet of things
- Robotics and artificial intelligence for autonomous mine systems

PROGRAM ADMISSION REQUIREMENTS

- A bachelor’s degree in some discipline of engineering from an ABET-accredited institution.
- Graduate Record Examination (GRE) is required. Applicants who have graduated from Mines within the past five years are not required to submit GRE scores.
- For international applicants or applicants whose native language is not English, a TOEFL score of 79 or higher (or 550 for the paper-based test, 213 for the computer-based test). In lieu of a TOEFL score, an IELTS score of 6.5 or higher will be accepted.

ACCEPTING APPLICATIONS
TO LEARN MORE, VISIT:
gradprograms.mines.edu/mnrd or contact mining@mines.edu