GEOLOGICAL ENGINEERING, M.S.

The graduate program offers training leading to the master of science and the doctor of philosophy degrees in geological engineering. Geological engineering is a rapidly growing field of study which integrates the two disciplines of geology and engineering. Geological engineers help find the best ways to use the earth's resources for solving technical problems while protecting the environment. The need for graduate education in geological engineering has been brought about by modern developments and activities in science and industry which have an impact on earth materials including soil, rock, and water. The area of study combines research and application methodologies of geology and of several engineering disciplines to address engineering problems in which the geologic nature of a site or geologic processes constitute major design objectives or constraints.

Emphasis in the program is on development of the student's ability to originate and perform analytical, numerical, and/or laboratory analysis techniques to address new and challenging earth-related problems associated with modern land-use practices, earththen construction, mineral extraction, and environmental pollution control and remediation. The program is expected to be of interest to students in engineering (particularly mining, civil, environmental, and mechanical) and physical sciences (particularly geology, geophysics, and geography). Students select their research topics from such areas as geotechnical and geo-environmental engineering, applied geophysics, hydrology and hydrogeology, numerical modeling of rock masses, remote sensing, rock mechanics, and rock engineering.

Modern facilities include rock physics and rock mechanics laboratories; drilling rig and instrumentation for rock and soil mechanics field testing; and soils, geosynthetics, and geo-environmental laboratories. Research assistantships, teaching assistantships, and fellowships are available to qualified applicants either upon admission or one to two semesters after entering the program.

MINIMUM GRADUATE COURSEWORK (50%) REQUIREMENT
At least 50% of credits applied toward the graduate degree credit requirement must be completed in graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university's Course Guide (http://my.wisc.edu/CourseGuideRedirect/BrowseByTitle).

PRIOR COURSEWORK REQUIREMENTS: GRADUATE WORK FROM OTHER INSTITUTIONS
With program approval, students are allowed to count graduate coursework from other institutions toward the minimum graduate degree credit requirement and the minimum graduate coursework (50%) requirement. No credits from other institutions can be counted toward the minimum graduate residence credit requirement. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

PRIOR COURSEWORK REQUIREMENTS: UW–MADISON UNDERGRADUATE
Up to 7 credits numbered 300 or above can be counted toward the minimum graduate degree credit requirement; if those 7 credits are from courses numbered 700 or above, they may be counted toward the minimum graduate coursework (50%) requirement. No credits can be counted toward the minimum graduate residence credit requirement. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

PRIOR COURSEWORK REQUIREMENTS: UW–MADISON UNIVERSITY SPECIAL
With program approval, students are allowed to count up to 15 credits of coursework numbered 300 or above taken as a UW–Madison Special student toward the minimum graduate residence credit requirement, and the minimum graduate degree credit requirement; if those credits are from courses numbered 700 or above, they may be counted toward the minimum graduate coursework (50%) requirement. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

CREDITS PER TERM ALLOWED
15 credits

PROGRAM-SPECIFIC COURSES REQUIRED
Contact the program for information on any additional required courses.

OVERALL GRADUATE GPA REQUIREMENT
3.00

OTHER GRADE REQUIREMENTS
The Graduate School requires an average grade of B or better in all coursework (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.

PROBATION POLICY
The Graduate School regularly reviews the record of any student who earned grades of BC, C, D, F, or Incomplete in a graduate course (300 or above), or grade of U in research credits. This review could result in probationary status.
in academic probation with a hold on future enrollment or in being suspended from the Graduate School.

**ADVISOR / COMMITTEE**

Every graduate student is required to have an advisor. To ensure that students are making satisfactory progress toward a degree, the Graduate School expects them to meet with their advisor on a regular basis.

An advisor generally serves as the thesis advisor. In many cases, an advisor is assigned to incoming students. Students can be suspended from the Graduate School if they do not have an advisor. An advisor is a faculty member, or sometimes a committee, from the major department responsible for providing advice regarding graduate studies.

A committee often accomplishes advising for the students in the early stages of their studies.

**ASSESSMENT AND EXAMINATIONS**

Contact the program for information on required assessments and examinations.

**TIME CONSTRAINTS**

Master's degree students who have been absent for five or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

**LANGUAGE REQUIREMENTS**

Contact the program for information on any language requirements.

**ADMISSIONS**

Admission to the program requires approval of the admissions committee. Applicants are normally expected to have a bachelor's degree in engineering or the physical sciences.

**LEARNING OUTCOMES**

**KNOWLEDGE AND SKILLS**

- demonstrate a strong understanding of mathematical, scientific, and engineering principles in the field.
- demonstrate an ability to formulate, analyze, and solve advanced engineering problems.
- demonstrate creative, independent problem solving skills.
- apply the latest scientific and technological advancements, advanced techniques, and modern engineering tools to these problems.

**PROFESSIONAL CONDUCT**

- recognize and apply principles of ethical and professional conduct.

**PEOPLE**

**Faculty:** Professors Noyce (chair), Adams, Bahia, Cramer, Feigl, Hanna, Harrington, Holloway, Hurley, Karthikeyan, Lee, Likos, Long, Noguera, McMahon, Park, Parra-Montesinos, Pedersen, Potter, Ran, Russell, Schauer, Wu; Associate Professors Ahn, Fratta, Loheide II, Pincheira Tinjum; Assistant Professors Block, Ginder-Vogel, Hedegaard, Hicks, Remucal, Sone, Wright. See also CEE faculty (http://directory.Engr.wisc.edu/CEE/Faculty).

**Geological Engineering Faculty:** Professors Likos (chair) (Civil and Environmental Engineering), Anderson (Geoscience), Bahr (Geoscience), Goodwin (Geoscience), Thurber (Geology and Geoscience), Tikoff (Geoscience), Tobin (Geoscience), Wang (Geoscience), Wu (Civil and Environmental Engineering), Feigl (Geoscience), Associate Professors Fratta (Civil and Environmental Engineering), Loheide (Civil and Environmental Engineering); Assistant Professors Cardiff (Geoscience), Tinjum (Engineering Professional Development) Ginder-vogel (Civil and Environmental Engineering), Sone (Civil and Environmental Engineering); Affiliate Professors Kung (Soil Science), Lowery (Soil Science), Plesha (Engineering Physics), Potter (Civil and Environmental Engineering). See also GLE faculty (http://gle.wisc.edu/Faculty-and-Staff).