GEOLOGICAL ENGINEERING, BS

A career in geological engineering offers opportunities to work outdoors, help communities grow and respond to climate change, and guide the sustainable use of natural resources.

Using geology and engineering to solve challenges in natural and built environments, you'll work with Earth's most fundamental resources: soils and rocks. These materials are essential for nearly every aspect of infrastructure and sustainability. You'll use them to:

- Support structures by designing foundations for structures, energy systems, and other critical infrastructure
- Build into them when excavating tunnels, canals, and mine passages
- Source construction materials by mining sand, gravel, and other materials used in roads, embankments, levees, and dams
- Access natural resources like groundwater for drinking and industrial uses, and mine valuable minerals and economic resources
- Harvest energy by exploring and developing sites for geothermal, wind, solar, oil, and gas energy
- Protect the environment when designing systems to contain pollutants, such as those found in landfills or resulting from chemical spills
- Engineer solutions to manage the risks and impacts of landslides, earthquakes, floods, and other natural hazards

Geological engineers are in demand as society adapts to climate change and resource depletion. Professionals in this field help us sustainably overcome the grand challenges we face in meeting our energy, infrastructure, and resource needs.

At the University of Wisconsin–Madison, geological engineering students excel with hands-on opportunities in well-equipped labs (https://engineering.wisc.edu/blog/gle-spotlight-sydney-klinzing-reflects-on-undergrad-research-and-student-life/), computer facilities, and field research sites. We study minerals, rocks, soil, and the history of the Earth to understand the natural world and how we can live and work in concert with it.

You will learn from faculty and staff from the College of Engineering and the College of Letters and Science, as well as practicing engineers. You'll use the tools and technology that geological engineers use every day, and you'll apply your knowledge to create multidisciplinary solutions for real-world challenges in our capstone design course (https://engineering.wisc.edu/blog/excellence-in-civil-engineering-education-capstone-course-wins-10th-and-11th-ncees-awards/).

As a student in our program, you can increase your career potential by earning a dual major in geological engineering and geology and geophysics (https://guide.wisc.edu/undergraduate/letters-science/geoscience/geology-geophysics-bs/) in a single 126-credit program, with no extra coursework. There are also a variety of certificate programs that you can pair with your degree, including two options for sustainable energy, to set yourself up for success.

We encourage students to take the Fundamentals of Engineering (FE) exam before or shortly after graduating (https://engineering.wisc.edu/blog/taking-the-fe-exam-as-an-undergrad/), which is the first step in professional engineering licensure. Geological engineering students surpasses the national average, ensuring our graduates are well-prepared for their careers.

Geological engineering (https://www.youtube.com/watch/?v=OAadlhKvlel) alumni from our program find rewarding careers with planning and design consulting firms; the natural resource sector; construction companies; energy developers and providers; and city/county, state, and federal agencies. Typical entry-level position titles include geological engineer, geotechnical engineer (https://engineering.wisc.edu/blog/geological-engineering-degree-sparks-rewarding-career-for-devin-welch/), geologist, design engineer, and project engineer.

HOW TO GET IN

HOW TO GET IN

ADMISSION TO THE COLLEGE AS A FIRST-YEAR STUDENT

Students applying to UW–Madison (https://www.admissions.wisc.edu/apply/) need to indicate an engineering major (https://engineering.wisc.edu/degrees-programs/undergraduate/) as their first choice in order to be considered for direct admission to the College of Engineering. Direct admission means that students get to start their college career in the engineering program of their choice and have access to engineering-specific resources and facilities. Students who are directly admitted need to meet progression requirements (https://engineering.wisc.edu/student-services/undergraduate-student-advising/progression/) at the end of the first year to guarantee advancement in that program.

CURRENT UW-MADISON STUDENTS (CROSS-CAMPUS TRANSFER TO ENGINEERING)

Requirements	Details
How to get in	Application required. Meeting the requirements listed below does not guarantee admission. (https://engineering.wisc.edu/admissions/undergraduate/cross-campus-students (https://engineering.wisc.edu/admissions/undergraduate/cross-campus-students/)/)

Application restrictions	• Students may apply a maximum of two times. • Students who have earned more than 72 course credits at UW-Madison (as indicated on the UW-Madison transcript) at the time of application are not eligible to apply for admission to the College of Engineering. Course credits in progress at the time of application are not included in the COE Credit Limit. • Students may apply to only one engineering degree program per admissions cycle. • Students who meet course/credit requirements and have a Core GPA below 2.500 would not be considered for admission in their selected engineering degree program (major) without an appeal process. All graded UW-Madison courses referenced in the Foundational Courses List and any degree program engineering courses level 200 or higher will be counted in the Core GPA (excludes E P D, INTEREGR, special topics, independent study, and seminar courses). All graded UW-Madison courses count in the Overall GPA. For one and only one of these core courses that a student has repeated, the more recent of the two grades will be used in the calculation of Core and Overall GPAs for admission purposes. Students may not be considered for admission if on academic probation for GPA reasons at time of review.
Credits required to get in	24 graded credits completed at UW-Madison, including at least one full-time (12 credit) semester. English as a Second Language course credits count toward the 24 credit minimum.
Courses required to get in	Engr Comm 1 (Comm A) requirement taken on a graded basis at UW-Madison. If the Comm A requirement has been satisfied through placement test, AP/IB, or transfer credit, then a liberal studies course of at least 3 credits (breadth designation of Humanities, Literature, or Social Sciences) must be taken on a graded basis at UW-Madison. Math course sequence through MATH 222. Four foundational courses completed on a graded basis at UW-Madison, as defined in the Foundational Courses List below.

Foundational courses list

Four Foundational Courses must be completed at UW-Madison as defined in 1. and 2.

1. Math Foundation

A minimum of two math courses numbered 221 or higher; one math course 300 level or higher; or calculus sequence completed through MATH 234. Excludes MATH 228, MATH/HIST SCI 473, special topics, independent study, seminar, pass/fail, and credit/no credit courses.

2. Engineering Foundation

A minimum of two courses as defined below:

Chemical Engineering:
(i) one course must be CHEM 104 or higher
(ii) one course must be PHYSICS 201/E M A 201 or higher

If the above two course requirements are completed with transfer or test credit, select from additional engineering foundation courses in (ii) below.

Aerospace Engineering, Biomedical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Engineering Mechanics, Engineering Physics, Environmental Engineering, Geological Engineering, Industrial Engineering, Materials Science and Engineering, Mechanical Engineering, Nuclear Engineering:
(i) one course must be CHEM 104 or higher OR PHYSICS 201/E M A 201 or higher
(ii) one other engineering foundation course from the following subject codes:

- Chemistry
- E M A 201, E M A 202, E M A 303
- PHYSICS 201 or higher
- Statistics, calculus-based
- COMP SCI 200, COMP SCI 220, COMP SCI 300 or higher, excluding COMP SCI 304
- excludes special topics, independent study, seminar, pass/fail, and credit/no credit courses

3. Additional foundational course options, if applicable

If the math and engineering foundational courses for the degree program are complete, then degree program engineering courses 200 level or higher can be taken to complete the Four Foundational Courses requirement. Excludes EPD, InterEGR, special topics, independent study, seminar, pass/fail, and credit/no credit courses.

Additional considerations

Cross-campus admission is selective. The admissions committee considers applicants' grades/grade trends, academic rigor, and personal statement. The College of Engineering offers an online information tutorial and advising (https://engineering.wisc.edu/admissions/undergraduate/cross-campus-students/) for students to learn about the cross-campus transfer process.

Semester	Deadline to apply	Decision notification timeline
To apply for a fall start	Mid May	Late June
To apply for a spring start	Late December/Early January	Late January
To apply for a summer start	This program does not accept applications to start in the summer.	

OFF-CAMPUS TRANSFER TO ENGINEERING

With careful planning, students at other accredited institutions can transfer coursework that will apply toward engineering degree requirements at UW–Madison. Off-campus transfer applicants are considered for direct admission to the College of Engineering by applying to the Office of Admissions with an engineering major listed as their first choice. Those who are admitted to their intended engineering program must meet progression requirements (https://engineering.wisc.edu/admissions/undergraduate/transfer-from-off-campus/) at the point of transfer or within their first two semesters at UW–Madison to guarantee advancement in that program. Transfer admission to the College of

Engineering is selective. A minimum of 30 credits in residence in the College of Engineering is required after transferring, and all students must meet all requirements for their engineering major.

The College of Engineering has dual degree transfer agreements with select four-year UW System campuses and a transfer agreement with Madison College. Eligible students in COE's transfer agreements automatically meet progression at the point of transfer.

Off-campus transfer students are encouraged to discuss their interests, academic background, and admission options with the Transfer & Academic Program Manager in the College of Engineering: ugtransfer@engr.wisc.edu.

SECOND BACHELOR'S DEGREE

The College of Engineering does not accept second undergraduate degree applications. Second degree student (https://engineering.wisc.edu/admissions/undergraduate/adult-students-second-degree-students/)s (https://engineering.wisc.edu/student-services/undergraduate-student-advising/) might explore the Biological Systems Engineering program at UW–Madison, an undergraduate engineering degree elsewhere, or a graduate program in the College of Engineering.

REQUIREMENTS

REQUIREMENTS

UNIVERSITY REQUIREMENTS

All undergraduate students must complete both the following Core General Education (Core GenEd) and University Degree and Quality of Work requirements. The requirements below apply to students whose first term at UW-Madison or whose earliest post-high school college attendance at any institution is Summer 2026 or later.

Students whose first term at UW-Madison or whose earliest post-high school college attendance at any institution occurred before Summer 2026 should refer to the archived Guide (https://guide.wisc.edu/archive/) for the requirements that apply to them.

CORE GENERAL EDUCATION (CORE GENED) REQUIREMENTS

Civics & Perspectives	3 credits of Civics & Perspectives coursework.
Communicatio & Literacy	6 credits of Communication & Literacy coursework. This requirement may be partially satisfied by a qualifying placement test score. More information: https://go.wisc.edu/qualifyingenglishplacement (https://go.wisc.edu/qualifyingenglishplacement/)
Humanities & Arts	6 credits of Humanities & Arts coursework.
Mathematics & Quantitative Reasoning	6 credits of Mathematics & Quantitative Reasoning coursework. This requirement may be partially satisfied by a qualifying placement test score. More information: https://go.wisc.edu/qualifyingmathplacement (https://go.wisc.edu/qualifyingmathplacement/)
Natural Science & Wellness	Complete both: • 6 credits of Natural Science & Wellness or Natural Science & Wellness + Laboratory coursework. • one course must be in Natural Science & Wellness + Laboratory coursework.
Social & Behavioral Science	3 credits of Social & Behavioral Science coursework.
Total Credits	30 credits.

For more information see the policy (https://policy.wisc.edu/library/UW-1095/).

UNIVERSITY DEGREE AND QUALITY OF WORK REQUIREMENTS

All undergraduate degree recipients must complete the following minimum requirements. Requirements for some programs will exceed these requirements; see program requirements for additional information.

Total Degree	120 degree credits.
Residency	Complete 30 credits in residence. A course is considered "in residence" if it is taken when in undergraduate degree-seeking status and: • is offered by UW-Madison and completed on the UW-Madison campus or at an approved off-site location, or • is offered by UW-Madison in an online or distance format, or is completed during participation in a UW-Madison study abroad/study away program.
Quality of Work	Achieve at least the minimum grade point average specified by the school, college, and/or academic program.
Math	Demonstrate minimal mathematics competence by: • placing above MATH 96, or, • successfully completing MATH 96, or • successfully completing a more advanced mathematics course such as MATH 112, MATH 113, MATH 114, MATH 141, MATH 211, or MATH 221.
English Language	If required to take the UW-Madison English as a Second Language Assessment Test (MSN-ESLAT), demonstrate minimal English language competence by: • earning credit for ESL 118, or • achieving a qualifying MSN-ESLAT placement test score.
Language	Complete one: • 2 high school units of a single language other than English, or • one course with the second semester Language designation.
Major Declaration	Declare and complete the requirements for at least one major.

COLLEGE OF ENGINEERING DEGREE GRANTING PROGRAMS' COMMON REQUIREMENTS

The College of Engineering departments collaborated and adopted a common set of guidelines in their degree granting program (major) requirements. Engineering departments incorporate specific coursework within their curricula to meet these guidelines. Students should refer to specific coursework detailed below the Summary of Requirements.

COLLEGE OF ENGINEERING DEGREE GRANTING PROGRAMS' COMMON REQUIREMENTS

Communication	All College of Engineering majors require two levels of communication coursework: • Engineering Communication 1: one course with the Communication A designation or satisfaction of Communication A based on eligible UW Placement Score. • Engineering Communication 2: each major specifies one course (e.g. INTEREGR 397) which also carries the Communication B designation.
Quantitative Reasoning	All College of Engineering majors require a math sequence that incorporates two levels of quantitative reasoning.
Humanities or Literature	All College of Engineering majors require a minimum of 6 credits with the Humanities or Literature breadth designations. See major Liberal Studies Electives Requirement below.
Social Sciences	All College of Engineering majors require a minimum of 3 credits with the Social Sciences breadth designation. See major Liberal Studies Electives Requirement below.
Natural Sciences	All College of Engineering majors require specific coursework that incorporates a minimum of 6 credits with the Biological, Natural, or Physical Science breadth designations.
Ethnic Studies	All College of Engineering majors require at least one course of at least 3 credits with the Ethnic Studies designation. This course may also be used to satisfy the Social Sciences or Humanities or Literature requirement.

GEOLOGICAL ENGINEERING, BS CURRICULUM

Students completing the geological engineering degree are also eligible to earn an additional major in geology and geophysics with no additional coursework. Students must contact an advisor to complete the necessary paperwork to declare the additional geology and geophysics major.

This curriculum applies to students admitted to the degree program this Guide academic year. Curricular requirements for students admitted in previous semesters are available in the Archive (https://guide.wisc.edu/archive/) section of Guide.

SUMMARY OF REQUIREMENTS

Code	Title	Credits
Mathematics		13
Engineering Principles and Professional Issues		11-14
Physical Science, Engineering Science, and Geoscience		44
Required Geological Engineering Courses		19
Technical Electives		15
Geological Engineering Design		
Communication Skills		8
Liberal Studies Electives		16
Fundamentals of Engineering Exam		
Total Credits		**126**

MATHEMATICS

Code	Title	Credits
MATH 221	Calculus and Analytic Geometry 1	5
MATH 222	Calculus and Analytic Geometry 2	4
MATH 234	Calculus--Functions of Several Variables	4
Total Credits		**13**

ENGINEERING PRINCIPLES AND PROFESSIONAL ISSUES

Code	Title	Credits
STAT 324	Introduction to Statistics for Science and Engineering	3
or STAT 311	Introduction to Theory and Methods of Mathematical Statistics I	
or I SY E 210	Introduction to Industrial Statistics	
CIV ENGR/G L E 291	Problem Solving Using Computer Tools	4
I SY E 313	Engineering Economic Analysis	3
Select one:		1-4
E P D 600	Special Topics in Engineering Professional Development (Topic: Core Competence in Sustainability)	
ENVIR ST/ GEOG 339	Conservation and Climate Change - Local to International Strategies	
ENVIR ST/ PHILOS 441	Environmental Ethics	
G L E 401	Special Topics in Geological Engineering (Topic: Ethics & Professionalism - GLE)	
INTEREGR 303	Applied Leadership Competencies in Engineering	
Total Credits		**11-14**

PHYSICAL SCIENCE, ENGINEERING SCIENCE AND GEOSCIENCE

Code	Title	Credits
Select one of the following:		5-9
CHEM 109	Advanced General Chemistry	
CHEM 103 & CHEM 104	General Chemistry I and General Chemistry II	
PHYSICS 202	General Physics	5
or PHYSICS 208	General Physics	
E M A 201	Statics (C grade or better)	3
E M A 202	Dynamics	3

E M A 303	Mechanics of Materials	3
CIV ENGR 310	Fluid Mechanics	3
GEOSCI 100	Introductory Geology: How the Earth Works	3
or GEOSCI/ ENVIR ST 106	Environmental Geology	
GEOSCI 202	Introduction to Geologic Structures	4
GEOSCI 204	Geologic Evolution of the Earth	4
GEOSCI/G L E 360	Principles of Mineralogy	3
GEOSCI/G L E 370	Elementary Petrology	3
GEOSCI/G L E 431	Sedimentology & Stratigraphy Lab	1
GEOSCI/G L E 455	Structural Geology	4
Total Credits		**44-48**

REQUIRED GEOLOGICAL ENGINEERING COURSES

Code	Title	Credits
G L E 171	Introduction to Geological Engineering	1
or INTEREGR 170	Design Practicum	
G L E/CIV ENGR 291	Problem Solving Using Computer Tools	4
G L E/ CIV ENGR 330	Soil Mechanics	3
G L E/CIV ENGR/ GEOSCI/ M S & E 474	Rock Mechanics	3
G L E 479	Geological Engineering Design	4
G L E/GEOSCI 594	Introduction to Applied Geophysics	3
G L E/GEOSCI 595	Field Methods in Applied and Engineering Geophysics	1
G L E/GEOSCI 627	Hydrogeology	4
Total Credits		**23**

TECHNICAL ELECTIVES (15 CREDITS)

Students must take a minimum 15 credits in the Technical Electives category, of which 5-6 credits must be design-focused (noted as 'D' in the tracks below), including at least one design-focused course taken prior to G L E 479 Geological Engineering Design. If students take G L E/ CIV ENGR 430 Introduction to Slope Stability and Earth Retention, G L E/CIV ENGR 432 Introduction to Shallow and Deep Foundation Systems and G L E/CIV ENGR 434 Introduction to Underground Openings Engineering, these combine to count as one design course. Additionally, if students take G L E/CIV ENGR 530 Seepage and Slopes, they can use G L E/CIV ENGR 432 and G L E/CIV ENGR 434 to count as one design credit; or, if students take G L E/CIV ENGR 532 Foundations, they can use G L E/CIV ENGR 430 and G L E/CIV ENGR 434 to count as one design credit.

The technical electives are organized into five tracks, described below. Students may select courses within these tracks to focus coursework in a particular area. However, students may complete the technical electives requirement using courses listed in multiple tracks. Suggested technical electives and associated design-focused credits (noted as 'D' in the tracks below) for each track are included below.

Students may take up to 6 credits of directed research credits as technical electives. In addition, one credit of G L E 1 Cooperative Education Program can be used as technical elective.

Energy, Minerals & Mining

Geological engineers possess knowledge and a skill set that serve society's need to manage extraction of traditional energy and mineral resources in more sustainable and efficient ways, develop renewable energy systems such as solar and wind energy sites, and to lead in new technologies to limit carbon emissions through geological sequestration or to develop geothermal exchange fields and reservoirs.

Within this track, the 16 credits of liberal studies can be framed to match those of the Energy Institute certificate in Energy Sustainability (https://guide.wisc.edu/undergraduate/engineering/engineering-physics/engineering-energy-sustainability-certificate/).

Code	Title	Credits
BSE/ENVIR ST 367	Renewable Energy Systems	3
CBE 562	Special Topics in Chemical Engineering (Topic: Energy & Sustainability)	1-3
CIV ENGR/ ENVIR ST/ GEOG 377	An Introduction to Geographic Information Systems	4
E M A 405	Practicum in Finite Elements	3
GEOSCI/ ENVIR ST 411	Energy Resources	3
GEOSCI 457	Conducted Field Trip	2
GEOSCI 515	Principles of Economic Geology	4
G L E 401	Special Topics in Geological Engineering (D) [1]	1-3
G L E/ CIV ENGR 430	Introduction to Slope Stability and Earth Retention (D)	1
G L E/ CIV ENGR 434	Introduction to Underground Openings Engineering (D)	1
G L E/ CIV ENGR 530	Seepage and Slopes (D)	3
G L E/ CIV ENGR 535	Wind Energy Balance-of-Plant Design (D)	3
G L E/GEOSCI 757	Advanced Rock Mechanics	3
G L E 801	Special Topics in Geological Engineering (Topic: Geomechanics)	1-3

[1] Only certain G L E 401 topics count as design courses. Please consult with your academic advisor for details.

Sustainability & Environment

Methods for quantifying the long-term effects of development, natural resource extraction, and environmental damage are often neglected or misapplied in cost-benefit life cycle analysis. This track intends to educate future professionals capable of leading the field in sustainable design and construction. The Sustainability & Environment track focuses on quantification, design, and optimization in relation to the use of natural resources and construction materials/methods as well as minimizing the long-term impacts of these activities.

Code	Title	Credits
BSE/ENVIR ST 367	Renewable Energy Systems	3
CBE 562	Special Topics in Chemical Engineering (Topic: Energy & Sustainability)	1-3
CIV ENGR 320	Environmental Engineering	3
CIV ENGR/G L E 421	Environmental Sustainability Engineering	3
CIV ENGR 427	Solid and Hazardous Wastes Engineering (D)	3
CIV ENGR 522	Hazardous Waste Management	3
CIV ENGR 619	Special Topics in Hydrology	1-3
CIV ENGR 649	Special Topics in Structural Engineering (Topic: Sustainable Construction)	1-3
GEOSCI/ ENVIR ST 411	Energy Resources	3
GEOSCI/G L E 629	Contaminant Hydrogeology (D)	3
G L E 401	Special Topics in Geological Engineering (D) [1]	1-3
G L E/ CIV ENGR 635	Remediation Geotechnics (D)	3
G L E/ CIV ENGR 732	Unsaturated Soil Geoengineering	3
SOIL SCI/ ENVIR ST 324	Soils and Environmental Quality	3

[1] Only certain G L E 401 Special Topics in Geological Engineering topics count as design courses. Please consult with your academic advisor for details.

Geohazards

The number of fatalities and the amount of economic loss due to natural and human-driven geohazards continue to increase. These losses may result from various geohazards, such as landslides, flooding, tsunamis, earthquakes, and volcanic eruptions. The Geohazards track aims to provide students with the necessary skills to perform analyses that minimize loss of life and economic costs associated with geohazards.

Code	Title	Credits
CIV ENGR/ ENVIR ST/ GEOG 377	An Introduction to Geographic Information Systems	4
CIV ENGR 514	Coastal Engineering (D)	2-3
E M A 405	Practicum in Finite Elements	3
GEOSCI/GEOG 320	Geomorphology	3
GEOSCI/G L E 350	Introduction to Geophysics: The Dynamic Earth	3
G L E/ CIV ENGR 430	Introduction to Slope Stability and Earth Retention (D)	1
G L E/CIV ENGR/ ENVIR ST/ GEOSCI 444	Practical Applications of GPS Surveying	2
G L E/ CIV ENGR 530	Seepage and Slopes (D)	3

Water

Water is an essential resource for humans and ecosystems. Water is also linked to mineral and energy resource production, waste management, and land reclamation. Population growth and climate change are creating increasing challenges to this resource. Development and sustainable management of groundwater and surface water, including prevention and mitigation of water quality problems, require combined expertise in geoscience, hydrology, and water resources engineering offered through the Water track.

Code	Title	Credits
CIV ENGR 311	Hydroscience	3
CIV ENGR 412	Groundwater Hydraulics	3
CIV ENGR 414	Hydrologic Design (D)	3
CIV ENGR 415	Hydrology	3
CIV ENGR 500	Water Chemistry	3
CIV ENGR 618	Special Topics in Hydraulics and Fluid Mechanics (D) [1]	1-3
CIV ENGR 619	Special Topics in Hydrology	1-3
GEOSCI/GEOG 320	Geomorphology	3
GEOSCI/GEOG 420	Glacial and Pleistocene Geology	3
GEOSCI 430	Sedimentology and Stratigraphy	3
GEOSCI/G L E 629	Contaminant Hydrogeology (D)	3
G L E 401	Special Topics in Geological Engineering (D) [2]	1-3
G L E/ CIV ENGR 430	Introduction to Slope Stability and Earth Retention (D)	1
G L E/CIV ENGR 511	Mixing and Transport in the Environment	3
G L E/ CIV ENGR 530	Seepage and Slopes (D)	3
G L E/ CIV ENGR 732	Unsaturated Soil Geoengineering	3

[1] Must take one of these topics: "Waterfront & Coastal Planning" or "Lake & River Rehabilitation."

[2] Only certain G L E 401 Special Topics in Geological Engineering topics count as design courses. Please consult with your academic advisor for details.

Infrastructure

There are many challenges that need to be overcome to address the aging infrastructure of this country as well as to develop cost effective solutions for new infrastructure in developing nations. The Infrastructure track is developed to provide students a background that enables them to perform engineering calculations to design, construct, assess the current condition (level of safety), and develop repair and retrofit solutions for civil engineering structures resting on, or constructed in, soil or rock.

Code	Title	Credits
CIV ENGR 649	Special Topics in Structural Engineering (Topic: Sustainable Construction)	1-3
E M A 405	Practicum in Finite Elements	3
GEOSCI/GEOG 320	Geomorphology	3
GEOSCI/GEOG 420	Glacial and Pleistocene Geology	3
GEOSCI 430	Sedimentology and Stratigraphy	3

G L E 401	Special Topics in Geological Engineering (D) [1]	1-3
G L E/ CIV ENGR 430	Introduction to Slope Stability and Earth Retention (D)	1
G L E/ CIV ENGR 432	Introduction to Shallow and Deep Foundation Systems (D)	1
G L E/ CIV ENGR 434	Introduction to Underground Openings Engineering (D)	1
G L E/CIV ENGR/ ENVIR ST/ GEOSCI 444	Practical Applications of GPS Surveying	2
G L E/ CIV ENGR 530	Seepage and Slopes (D)	3
G L E/ CIV ENGR 532	Foundations (D)	3
CIV ENGR/ G L E 534	Nondestructive Evaluation	3
G L E/ CIV ENGR 535	Wind Energy Balance-of-Plant Design (D)	3
G L E/ CIV ENGR 730	Engineering Properties of Soils	3

[1] Only certain G L E 401 topics count as design courses. Please consult with your academic advisor for details.

COMMUNICATION SKILLS

Code	Title	Credits
Engr Comm 1		
INTEREGR 156	Introduction to Writing, Speaking, and Ethics for Engineers	3
or ENGL 100	Introduction to College Composition	
or COM ARTS 100	Introduction to Speech Composition	
or LSC 100	Science and Storytelling	
or ESL 118	Academic Writing II	
Speech Related		
INTEREGR 275	Technical Presentations	2
or COM ARTS 181	Elements of Speech-Honors Course	
or COM ARTS 262	Argumentation and Debate	
or COM ARTS 266	Theory and Practice of Group Discussion	
Engr Comm 2		
INTEREGR 397	Engineering Communication	3
Total Credits		**8**

LIBERAL STUDIES ELECTIVES

Students must complete **16 credits** of College of Engineering Liberal Studies Electives Requirements (http://guide.wisc.edu/undergraduate/engineering/#requirementstext).

FUNDAMENTALS OF ENGINEERING EXAM

All students must take the Fundamentals of Engineering exam.

HONORS IN RESEARCH

Students in geological engineering that have completed at least two semesters on the Madison campus with a cumulative GPA of **at least** 3.5 may apply to participate in the Honors in Research program. Students may register for 1 to 3 credits per semester. A grade of P (Progress) will be assigned each semester until the student completes the honors in research program or drops out of the program, at which time a final grade is assigned (based on research progress and the written thesis, if completed). This becomes the grade for all credits taken in G L E 489 Honors in Research.

A senior thesis worth 3 credits of G L E 489 Honors in Research is required. The senior thesis is a written document reporting on a substantial piece of work that is prepared in the style of a graduate thesis. The thesis advisor determines the grade which the student receives for the thesis. A bound copy of the thesis must be submitted to the geological engineering office to complete the program.

The designation "Honors in Research" will be recorded on the student's transcript if the following criteria are met:

1. Satisfaction of requirements for an undergraduate degree in Geological Engineering.
2. A cumulative grade-point average of at least 3.3.
3. Completion of a total of at least 8 credits in G L E 489 Honors in Research.
4. Completion of a senior honors thesis with a final grade of B or better.

Students interested in the Honors in Research program should contact their advisor or the G L E director for more information. Applications to the program are to be submitted to the G L E director with a supporting letter from the student's academic and thesis advisors. Decisions regarding acceptance are made by the G L E director.

LEARNING OUTCOMES

LEARNING OUTCOMES

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

FOUR-YEAR PLAN

FOUR-YEAR PLAN

Sample Four-Year Plan

First Year

Fall	Credits	Spring	Credits
MATH 221	5	MATH 222	4
CHEM 109	5	E M A 201	3
GEOSCI 100 or 106	3	GEOSCI 204	4
Engr Comm 1	3	G L E 171	1
		Liberal Studies Elective	4
	16		**16**

Second Year

Fall	Credits	Spring	Credits
MATH 234	4	CIV ENGR 310	3
E M A 202	3	E M A 303	3
GEOSCI/G L E 360	3	PHYSICS 202 or 208	5
GEOSCI 202	4	GEOSCI/G L E 370	3
CIV ENGR/G L E 291	4	Liberal Studies Elective	3
	18		**17**

Third Year

Fall	Credits	Spring	Credits
STAT 324 or 311	3	Technical Elective	3
Technical Elective	3	Professional Issues	1-4
CIV ENGR/G L E 330	3	G L E/CIV ENGR/ GEOSCI/M S & E 474	3
G L E/GEOSCI 431	1	GEOSCI/G L E 455	4
Liberal Studies Elective	3	INTEREGR 397	3
INTEREGR 275	2		
	15		**14-17**

Fourth Year

Fall	Credits	Spring	Credits
Ethnic Studies	3	G L E 479	4
G L E/GEOSCI 594	3	Liberal Studies Elective	3
G L E/GEOSCI 595	1	I SY E 313	3
G L E/GEOSCI 627	4	Technical Elective	3
Technical Elective (design)	3	Technical Elective (design)	3
	14		**16**

Total Credits 126-129

ADVISING AND CAREERS

ADVISING AND CAREERS

ADVISING

Every College of Engineering undergraduate has an assigned academic advisor (https://engineering.wisc.edu/student-services/undergraduate-student-advising/). Academic advisors support and coach students through their transition to college and their academic program all the way through graduation.

Advisors help students navigate the highly structured engineering curricula and course sequencing, working with them to select courses each semester.

When facing a challenge or making a plan toward a goal, students can start with their academic advisor. There are many outstanding resources at UW–Madison, and academic advisors are trained to help students navigate these resources. Advisors not only inform students about the various resources, but they help reduce the barriers between students and campus resources to help students feel empowered to pursue their goals and communicate their needs.

Students can find their assigned advisor in their MyUW Student Center.

ENGINEERING CAREER SERVICES

Engineering Career Services (https://ecs.wisc.edu) (ECS) assists students in finding work-based learning experiences such as co-ops and summer internships, exploring and applying to graduate or professional school, and finding full-time professional employment.

ECS offers two large career fairs per year, assists students with resume building and developing interviewing skills, hosts skill-building workshops, and meets one-on-one with students to discuss offer negotiations.

Students are encouraged to engage with the ECS office early in their academic careers. For more information on ECS programs and workshops, visit: https://ecs.wisc.edu.

RESOURCES AND SCHOLARSHIPS

RESOURCES AND SCHOLARSHIPS

LABS AND FACILITIES

The geological engineering program utilizes laboratories that are shared with other departments. They include:

Land Information and Surveying Laboratories
Fluid Mechanics Laboratory
Materials Testing Laboratory
Geology and Hydrogeology Laboratories
Rock Mechanics Laboratory
Geoengineering Laboratories

SCHOLARSHIPS

For department and college-wide scholarship information, visit College of Engineering Scholarships (https://engineering.wisc.edu/admissions/scholarships/).

ACCREDITATION

ACCREDITATION

Accredited by the Engineering Accreditation Commission of ABET (https://www.abet.org/), https://www.abet.org, under the commission's General Criteria and Program Criteria for Geological and Similarly Named Engineering Programs.

PROGRAM EDUCATIONAL OBJECTIVES FOR THE BACHELOR OF SCIENCE IN GEOLOGICAL ENGINEERING

We recognize that our graduates will choose to use the knowledge and skills that they have acquired during their undergraduate years to pursue a wide variety of career and life goals, and we encourage this diversity of paths. Whatever path our graduates may choose, we expect them to be meeting the following objectives at least three to five years after graduation:

1. apply geological engineering principles, analyses, and synthesis to design and implement projects in the natural and built environment;
2. incorporate economic, environmental, political, ethical, social, safety, and global considerations to generate sustainable solutions in the natural and built environment;
3. exhibit strong communication, leadership, and teamwork skills;
4. serve others through professional responsibility and participation in professional and public activities and good citizenship; and
5. demonstrate a continuing commitment to and interest in their own and others' education.

Note: Undergraduate Student Outcomes, number of degrees conferred, and enrollment data are made publicly available at the Geological Engineering Undergraduate Program website (https://engineering.wisc.edu/programs/degrees/geological-engineering-bs/). (In this Guide, the program's Student Outcomes are available through the "Learning Outcomes" tab.)