

## Interested in This Major?

**Current Students:** Visit us in Lapham Hall, Room 366, call us at 414-229-4561, or email [geo-info@uwm.edu](mailto:geo-info@uwm.edu)

**Not a UWM Student yet?** Call our Admissions Counselor at 414-229-7711 or email [let-sci@uwm.edu](mailto:let-sci@uwm.edu)

**web:** [geosciences.uwm.edu](http://geosciences.uwm.edu)



## What is Geosciences?

Sometimes called “Earth Sciences” in high school, Geosciences covers a broad range of topics related to our planet – its soil, minerals, climate change, magnetic fields, earthquakes, water sources such as lakes, rivers, oceans, plants, fossils, volcanoes and more. Depending on their area of specialization, geoscientists use tools and skills from physics, chemistry, biology and mathematics to better understand and explain Earth’s complex and overlapping systems. Geoscientists analyze how the earth has changed over time and how it may continue to change in the future.

## What Do Geoscientists Do?

Geoscientists work in many different settings, and most are involved in some type of outdoor fieldwork as part of their jobs. Some geoscientists work for natural resource companies, such as oil. Other large employers include environmental consulting companies, construction, architectural and engineering firms, government agencies such as the Bureau of Land Management, Department of Natural Resources, Forest Service, Department of Energy and the US Army Corps of Engineers, museums, and universities.

Some geoscientists focus on collecting and conducting lab analysis of samples. Others work on planning how to use and distribute natural resources. Research and development of new geological theories is another career track.

## Career Prospects

The field of geoscience ranges widely, from soil experts to water technicians to oil specialists and dozens of other specialties in between. Salaries are equally as widespread. Entry-level salaries can be anywhere from \$30,000 to \$60,000, while experienced professionals can earn well above \$150,000, depending on specialty and expertise.

**As population and demand on the planet are rising at the same time that existing resources are growing scarcer, the long-range job outlook for geoscientists remains high. The Bureau of Labor Statistics predicts a faster than average growth in jobs for geologists from now until 2024.**

## Geosciences at UWM

We offer two degree options. The geology-geophysics option leads to a Bachelor of Science (BS) degree and is designed to prepare students for graduate school or a career as a geoscientist. The general option leads to a Bachelor of Arts (BA) degree and is designed for people, including primary and secondary school teachers, who have a broad interest in earth sciences. Both degrees require a field camp (typically taken in summer) and have the same core courses. The BS degree requires 18 elective credits in geosciences along with more mathematics and laboratory science; the BA requires 9 elective credits in addition to some chemistry and physics.

The program is organized around four broad areas, and students can organize their electives around a particular area if desired:

## IS GEOSCIENCES RIGHT FOR ME?

Geosciences is an ideal major for students with an interest in the environment around them and a natural curiosity about the planet’s development and change over time. Students in geosciences generally like all types of science, enjoy the outdoors and like to travel to places that are off the beaten path. Successful Geosciences majors enjoy applying computer technology to solve real-world problems and have a spirit of discovery and adventure.



**Hard Rock** – Members of the hard rock group study structural geology, mineralogy, petrology (rocks), volcanology and tectonics, with a focus on mitigating natural hazards, developing Earth's resources, and providing context for human origins and climate change.

**Hydrogeology** – The hydro group examines the quality and quantity of water resources in the world today with emphasis on solving the environmental problems caused by increasing human stress on hydrologic systems.

**Paleontology** – Researchers in this area focus on broad evolutionary patterns in the history of life. Microbial and metazoan life are examined within their environmental contexts. Current projects include biotic crises and early animal evolution.

**Sedimentary Geology and Surficial Processes** – This area studies rocks, fossils and changes in the Earth's biological and chemical make-up over time. Volcanic, glacial, reef and fluvial landforms are all areas of inquiry.

### Core Courses for all Majors

Course #	Course Title
Geo Sci 100	Intro to the Earth
Geo Sci 102	Historical Geology
Geo Sci 301	Principles of Mineralogy
Geo Sci 302	Elementary Petrology
Geo Sci 414	Structural Petrology
Geo Sci 455	Field Geology
Geo Sci 511	Stratigraphy and Sedimentation
one semester of physics with lab	
one semester of chemistry with lab (usually Chem 102)	

### Additional Required Courses for Geology-Geophysics Option (BS)

In addition to the core courses, BS students take:

Geo Sci 316	Intro to Geophysics
18 additional geoscience credits, including at least two courses from Geo Sci 400, 401, 409, 443, 463, 464 or 563	
Math 231	Calculus and Analytic Geometry I

### Additional Required Courses for General Option (BA)

In addition to the core courses, BA students take:

9 additional geoscience credits numbered 300 or above	
---	--

### Field Camps

Field camp is required for a degree from the Department of Geosciences. For the BS, field camps are typically 5-7 weeks long and are taken over the summer at other universities. Shorter field camps are acceptable for the BA. There are many field camps to choose from, however space is limited at many of them so you must apply early. Most field camps focus on geologic field mapping exercises, but some also have environmental or hydrogeological applications. Choosing a field camp is dependent on several factors including cost, length of the field camp, where the field camp takes place (is there a certain region you would like to work in), and the type of exercises being done (geologic vs. hydrogeologic). Past students have been to field camps in Montana, Ireland, New Zealand, Turkey, South Dakota, Wyoming, Idaho, Utah and Oregon, just to name a few.



### Facilities and Resources

Research is a vital component to the program, and the department has state-of-the-art facilities and equipment to carry out that research.

- Fourier Transform Infrared Spectrometer (FTIR) (for determining gas content in igneous rocks)
- Geochemistry lab and soils lab
- Demagnetization instrument
- Demagnetization chamber (for determining paleomagnetic direction)
- Flume machine (for looking at sediment structures at various stream velocities)
- Rock saws for prepping rock samples for analysis
- Bruker S4 Pioneer X-ray Fluorescence Spectrometer (XRF)
- Bruker D8 Focus X-ray Diffractometer (XRD)
- Claisse M4 fusion system (to make glass discs for XRF analysis)
- Thomas A. Greene Geological Gallery (75,000 piece collection of fossils, minerals and ores)

### Student Clubs

The **Geology Club** is a student organization that works to promote the earth sciences on campus and to provide educational and social support to its members. They meet regularly to discuss current issues and plan events.

The **Paleo Club** is a student organization for anyone interested in fossils and paleontology. Meetings cover everything from fossil identification to trip planning to learning about the latest discoveries in paleontology.

Revised 11/2018





This sample four-year plan shows just one possible pathway to earning a degree with this major in four years. This plan **does not** replace the advice of your advisor, and students are cautioned to meet regularly with their advisor to create a personalized plan that matches their particular circumstances. This plan also follows the degree requirements for students who began their college education in Fall of 2013 or later. If you started college prior to Fall of 2013, your degree requirements may be different.

### Degree Requirements for a Bachelor of Arts with a Geosciences major (brief summary):

Geosciences is also available as a Bachelor of Science degree with a different set of requirements (see next page).

- English Proficiency and UWM Oral and Written Communication (OWC) GER - English 102 (fulfills Part A) and one OWC-Part B course.
- Math Proficiency, UWM Quantitative Literacy (QL) GER, and Formal Reasoning – two courses can satisfy all three requirements. Some courses have prerequisites, however, so a student may end up taking more than two total classes depending on his/her placement test scores. Students will usually take Math 103, 105, or 108 AND either a 200-level or above math course, Philosophy 211, or an approved Letters & Science statistics course.
- Foreign Language – 4 semesters of a single Foreign Language (or 3 semesters of one language and 2 semesters of another language) (May be satisfied through 4 years of a single Foreign Language in high school.)
- L&S Humanities – 12 credits
- L&S Social Sciences – 12 credits
- L&S Natural Science – 12 credits including one laboratory
- L&S International – 9 credits usually accomplished in conjunction with Humanities and/or Social Science courses
- UWM Arts GER – 3 credits
- UWM Cultural Diversity GER – 3 credits usually accomplished in conjunction with a Humanities or Social Science course
- 120 credits including 90 credits in L&S and with 36 of the 90 credits in L&S upper-level (numbered above 300) courses
- Complete the Geosciences major requirements in the general option.
  - All of Geo Sci 100, 102, 301, 302, 414, 455, 511
  - Additional Geoscience credits to reach a minimum of 30 total Geosciences credits with at least 15 of those at the 300-level or above and completed at UWM
  - One chemistry course with lab (usually Chem 102)
  - One physics course with lab (usually Physics 120/121)

### Sample Four Year Plan BA Geosciences (general option):

There are hundreds of courses that satisfy various requirements and courses can count towards more than one requirement. For example, Geo Sci 100 counts towards the major and as a natural science. (This sample assumes no high school Foreign Language was taken and that the student placed into college-level math and English.)

	Semester 1	Semester 2
Year 1	English 101	English 102 (OWC-A)
	Math 105 (QL-A)	Math Stat 215 (QL-B)
	1st semester Foreign Language	2nd semester Foreign Language
	L&S Social Science	Chem 100
	Geo Sci 100 (NS)	Geo Sci 102 (NS)
Year 2	Geo Sci 301 (NS+)	Physics 120/121 (NS+)
	Chem 102 (NS+)	Arts GER
	3rd semester Foreign Language (Int'l)	4th semester Foreign Language (Int'l)
	Elective	L&S Humanities / Cultural Diversity
Year 3	Geo Sci upper-level	Geo Sci 414 (NS+)
	Geo Sci 302 (NS+)	Geo Sci 511 (NS+)
	L&S Humanities / International	Geo Sci 545 or other OWC-B course
	L&S upper-level	L&S Humanities
	L&S Social Science	L&S upper-level
SUMMER SESSION Geo Sci 455		
Year 4	Geo Sci upper-level	Geo Sci upper-level
	L&S Social Science	L&S upper-level
	Elective	Geo Sci upper-level
	L&S upper-level	L&S Humanities
	L&S upper-level	L&S Social Science

(NS) Natural Science GER

(Int'l) International GER

(QL) Quantitative Literacy - Parts A and B

(OWC) Oral and Written Communication - Parts A and B



This sample four-year plan shows just one possible pathway to earning a degree with this major in four years. This plan **does not** replace the advice of your advisor, and students are cautioned to meet regularly with their advisor to create a personalized plan that matches their particular circumstances. This plan also follows the degree requirements for students who began their college education in Fall of 2013 or later. If you started college prior to Fall of 2013, your degree requirements may be different.

### Degree Requirements for a Bachelor of Science with a Geosciences major (brief summary):

**Geosciences is also available as a Bachelor of Arts degree with a different set of requirements (see previous page).**

- English Proficiency and UWM Oral and Written Communication (OWC) GER - English 102 (fulfills Part A) and one OWC-Part B course.
- Math Proficiency, UWM Quantitative Literacy (QL) GER, and Formal Reasoning - two courses will satisfy all three requirements for students pursuing a Bachelor of Science. At a minimum, Math through the first semester calculus and at least one other 200-level Math class or an approved statistics class will fulfill the degree requirement for all BS students.
- Foreign Language – 2 semesters of a single Foreign Language (may be satisfied through 2 years of a single Foreign Language in high school)
- L&S Humanities – 12 credits
- L&S Social Sciences – 12 credits
- L&S Natural Science – 12 credits including a laboratory course in three distinct natural science areas
- L&S International – 9 credits usually accomplished in conjunction with Humanities and/or Social Science courses
- UWM Arts GER – 3 credits
- UWM Cultural Diversity GER – 3 credits usually accomplished in conjunction with a Humanities or Social Science course
- 120 credits including 90 credits in L&S and with 36 of the 90 credits in L&S upper-level (numbered 300 and above) courses and 30 of those 36 credits in designated upper-level Natural Science
- Complete the Geosciences major requirements in the geology-geophysics option.
  - All of Geo Sci 100, 102, 301, 302, 316, 414, 455, 511
  - Two of Geo Sci 400, 401, 409, 443, 463, 464, 562, 563
  - Additional Geoscience credits to reach a minimum of 44 total Geosciences credits with at least 15 of those at the 300-level or above and completed at UWM
  - Chem 102
  - Math 231
  - Either Physics 120/121 or Physics 209/210

### Sample Four Year Plan BS Geosciences:

There are hundreds of courses that satisfy various requirements and courses can count towards more than one requirement. For example, Geo Sci 100 counts towards the major and as a natural science. (This sample assumes the student took at least two years of Foreign Language in high school and that the student placed into college-level math and English.)

	Semester 1	Semester 2
Year 1	English 101	English 102 (OWC-A)
	Math 105 (QL-A)	Math 116 and 117
	L&S Humanities	Chem 100 (NS)
	L&S Social Science	Geo Sci 102 (NS)
	Geo Sci 100 (NS)	
Year 2	Math 231(NS) (QL-B)	MthStat 215 or other 200-level math
	Physics 120/121 (NS+)	Arts GER
	Chem 102 (NS+)	L&S Humanities
		L&S Social Science/ International
Year 3	L&S Humanities	Geo Sci 545 or other OWC-B course
	Geo Sci 316 (NS)	Geo Sci 511 (NS+)
	Geo Sci 301 (NS+)	Geo Sci 302 (NS+)
	Geo Sci upper-level	L&S upper-level
	Elective	Geo Sci upper-level
Year 4	Geo Sci 414 (NS+)	L&S Humanities/Cultural Diversity
	Geo Sci upper-level	Geo Sci upper-level
	Geo Sci upper-level	Geo Sci upper-level
	L&S Humanities	Elective
	L&S Social Science/ International	L&S Social Science/ International
SUMMER SESSION - Geo Sci 455		

(NS) Natural Science GER

(QL) Quantitative Literacy - Parts A and B

(OWC) Oral and Written Communication - Parts A and B

Revised 11/2018