

GEOSCIENCES, B.S.

Begin Campus: Any Penn State Campus

End Campus: University Park

Degree Requirements

For the Bachelor of Science degree in Geosciences, a minimum of 121 credits is required:

Requirement	Credits
General Education	45
Requirements for the Major	97

21 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 9 credits of GN courses, 6 credits of GQ courses, 6 credits of GWS courses.

Requirements for the Major

To graduate, a student enrolled in the major must earn a grade of C or better in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 (<https://senate.psu.edu/students/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/>).

Common Requirements for the Major (All Options)

Code	Title	Credits
Prescribed Courses		
BIOL 110	Biology: Basic Concepts and Biodiversity	4
CHEM 110	Chemical Principles I	3
CHEM 111	Experimental Chemistry I	1
CHEM 112	Chemical Principles II	3
CHEM 113	Experimental Chemistry II	1
EMSC 100S	Earth and Mineral Sciences First-Year Seminar ¹	3
GEOSC 1	Physical Geology ²	3
GEOSC 204	Geobiology	4
GEOSC 472A	Field Geology I: Geoscience Field Methods	3
GEOSC 472B	Field Geology II: Geoscience Field Investigations	3
GEOSC 494W	Senior Thesis	3
GEOSC 496	Independent Studies	1
MATH 141	Calculus with Analytic Geometry II	4
PHYS 211	General Physics: Mechanics	4
PHYS 213	General Physics: Fluids and Thermal Physics	2

Prescribed Courses: Require a grade of C or better

GEOSC 201	Earth Materials	4
GEOSC 202	Chemical Processes in Geology	4
GEOSC 203	Physical Processes in Geology	4
GEOSC 310	Earth History	4
GEOSC 465	Structural Geology	4
MATH 140	Calculus With Analytic Geometry I	4

Additional Courses

ENGL 15	Rhetoric and Composition	3
or ENGL 30H	Honors Rhetoric and Composition	

Requirements for the Option

Select an option	28
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¹ The following substitutions are allowed for students attending campuses where the indicated course is not offered: CAS 100 or ENGL 202C can be substituted for EMSC 100S.

² If GEOSC 1 is not available, GEOSC 20 may be substituted

Requirements for the Option

General Option (28 credits)

Code	Title	Credits
Additional Courses		
Select 14 credits of the following 300- and 400-level GEOSC courses:		14
GEOSC 303	Introduction to Environmental Geology	
GEOSC 340	Geomorphology	
GEOSC 402Y	Natural Disasters	
GEOSC 416	Stable and Radioactive Isotopes in Geosciences: Introduction	
GEOSC 422	Vertebrate Paleontology	
GEOSC 424	Paleontology and Fossils	
GEOSC 434	Volcanology	
GEOSC 439	Principles of Stratigraphy	
GEOSC 440	Marine Geology	
GEOSC 451	Natural Resources: Origins, Economics and Environmental Impact	
GEOSC 452	Hydrogeology	
GEOSC 454	Geology of Oil and Gas	
GEOSC 470W	Introduction to Field Geology	
GEOSC 489	Dynamics of the Earth	

Supporting Courses and Related Areas

Select at least 2 credits in physics from approved departmental list	2
Select 3 credits of computer science, mathematics ¹ , or statistics	3
Select 9 credits, in consultation with adviser, supportive of the student's interest (students may apply 6 credits of ROTC)	9

¹ Above the level of MATH 141

Hydrogeology Option (28 credits)

Code	Title	Credits
Prescribed Courses		
GEOSC 452	Hydrogeology	3
Additional Courses		
Select one of the following:		3
CMPSC 201	Programming for Engineers with C++	
CMPSC 202		
CMPSC 203	Introduction to Spreadsheets and Databases	
STAT 250	Introduction to Biostatistics ¹	
Select one of the following:		3
ASM 327	Soil and Water Resource Management	
ERM 450	Wetland Science and Sustainability	
SOILS 101	Introductory Soil Science	
Select 9 credits from options A and B, with at least 3 credits from A and 3 credits from B:		9
<i>Option A</i>		
CHEM 202	Fundamentals of Organic Chemistry I	
CHEM 450	Physical Chemistry - Thermodynamics	

ERM 433	Transformation of Pollutants in Soils
GEOSC 413W	Techniques in Environmental Geochemistry
GEOSC 419	The Organic Geochemistry of Natural Waters and Sediments
<i>Option B</i>	
ENVSE 408	Contaminant Hydrology
GEOG 362	Remote Sensing and Image Analysis
GEOSC 340	Geomorphology
GEOSC 439	Principles of Stratigraphy
GEOSC 454	Geology of Oil and Gas
GEOSC 483	Environmental Geophysics

Supporting Courses and Related Areas

Select at least 2 credits in Physics from approved departmental list	2
Select 8 credits, in consultation with advisor, supportive of the student's interest (students may apply 6 credits of ROTC)	8

¹ If STAT 250 is not available, STAT 200 may be substituted.

General Education

Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (<https://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program/>) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

Foundations (grade of C or better is required and Inter-Domain courses do not meet this requirement.)

- **Quantification (GQ):** 6 credits
- **Writing and Speaking (GWS):** 9 credits

Breadth in the Knowledge Domains (Inter-Domain courses do not meet this requirement.)

- **Arts (GA):** 3 credits
- **Health and Wellness (GHW):** 3 credits
- **Humanities (GH):** 3 credits
- **Social and Behavioral Sciences (GS):** 3 credits
- **Natural Sciences (GN):** 3 credits

Integrative Studies

- **Inter-Domain Courses (Inter-Domain):** 6 credits

Exploration

- **GN**, may be completed with Inter-Domain courses: 3 credits
- **GA, GH, GN, GS, Inter-Domain courses.** This may include 3 credits of World Language course work beyond the 12th credit level or the requirements for the student's degree program, whichever is higher: 6 credits

University Degree Requirements

First Year Engagement

All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

Cultures Requirement

6 credits are required and may satisfy other requirements

- United States Cultures: 3 credits
- International Cultures: 3 credits

Writing Across the Curriculum

3 credits required from the college of graduation and likely prescribed as part of major requirements.

Total Minimum Credits

A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.

Quality of Work

Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

Limitations on Source and Time for Credit Acquisition

The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (<https://senate.psu.edu/students/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/>)). For more information, check the Suggested Academic Plan for your intended program.