B.S. in Geology - Effective Fall 2017

Students with a Geology BS degree are well prepared to take advantage of career opportunities in energy and mineral industries, environmental geology, paleontology, and geological data analysis. Students are encouraged to choose electives emphasizing one of these areas depending on their career interests. Broad elective choices across these geological focus areas will also provide a solid basis for graduate study in the geosciences, or with careful planning of free electives, for admission to post-graduate professional schools of education, research, law, or medicine.

FRESHMAN YEAR

First Semester

__CHEM 112	General Chemistry	(3-0) 3
__CHEM 112L	Exper. Gen. Chemistry I	(0-1) 1
__ENGL 101	Composition I	(3-0) 3
__GEOL 201	Physical Geology	(3-0) 3
__GEOL 201L	Physical Geology Lab	(0-1) 1
__GEOL 110	Explorations in Geology	2
		13

Note: Some students may need preparatory math in the first semester, such as MATH 102 or MATH 120.

Second Semester

__MATH 123	Calculus I	(4-0) 4
__CHEM 114	General Chemistry II	(3-0) 3
__CHEM 114L	Exper. Gen. Chemistry II	(0-1) 1
__	Gen Ed Humanities/Social Science Elective[1]	6
		14

SOPHOMORE YEAR

First Semester

__PHYS 211	Univ. Physics I	(3-0) 3
__MATH 125	Calculus II	(4-0) 4
__GEOL 323	Search for Our Past[2]	(3-0) 3
__ One of	CSC 150 Comp. Sci. I	(2-1) 3
	CSC 170 Programing for Eng. Sci.	(2-1) 3
	CSC 111 Intro Comp. Prog	(2-0) 2
__	Gen Ed Humanities/Social Science Elective[1]	3
		15-16

Second Semester

__PHYS 213	Univ. Physics II	(3-0) 3
__ One of	MATH 225 Calculus III[3]	(4-0) 4
	MATH 381 Intro to Statistics	(3-0) 3
__ENGL 279	Technical Communications I[1]	(3-0) 3
__GEOL 212	**Mineral. and Crystallog.**[2]	(2-1) 3
__	Gen Ed Humanities/Social Science Elective[1]	3
		15-16

JUNIOR YEAR

First Semester

__GEOL 331	Stratig. and Sedimentation[2]	(2-1) 3
__GEOL 341	**Intro to Ign/Met Petrology**[2]	(2-1) 3
__GEOL 416	Introduction to GIS[2]	(2-1) 3
__ENGL 289	Technical Communications II[1]	3
__	Program Elective[4]	3
		15

Second Semester

__GEOL 322	**Structural Geology**[2]	(2-1) 3
__GEOL 461	Invert. Paleontology[2]	(2-1) 3
__One of	GeoE 324 Eng Geophysics	
	GeoE 482 Applied Geomorph**	(2-1) 3
__	Program Elective[4]	3
__	Free Elective	3
		15

Summer

__GEOL 410	**Field Geology**[2]	(0-6) 6
		6

SENIOR YEAR

First Semester

__GEOL 464	**Senior Research I**[2]	**(1-0) 1**
__	Program Electives[4]	6
__	Free elective	3
__	Humanities/Social Science elective	3
		13

Second Semester

__GEOL 465	**Senior Research II**[2, 5]	**3**
__	Program Electives[4]	6
__	Free electives	3-5
		12-14

120 semester credits are required.
**Course offered in alternate years.
Critical sequence, must be taken in the specified semester.

Curriculum Notes

[1] Students must complete 27 credits of the general education core in their first 64 credit hours, including 6 credits of science, 3 cr math, 6 cr English/Technical Communication, 6 cr humanities, and 6 cr social science. ENGL 289 yields an additional 3 general education credits, for a total of 30.

[2] A grade of C or better is required in these courses for graduation with a Geology B.S.

[3] Students should consult an advisor when choosing math courses.

[4] Program electives must have a GEOL or GEOE prefix. At **least 9 of the 18 total credits must be taken from 400-level courses.** Substitutions must be approved by the department head.

[5] Under exceptional circumstances, a student may petition the department head to substitute geology electives for GEOL 465; however, all students must pass GEOL 464.

Electives Worksheet (see reverse for list of recommended electives by career focus)

List Goal 3 Social Sci Electives (6 cr)*

_____ ( )
_____ ( )

List Goal 4 Hum Electives (6 cr)*

_____ ( )
_____ ( )

List Additional Hum/SS Electives (3 cr)

_____ ( )
_____ ( )

* GE electives must be chosen from a list in the university catalog.

List Free Electives (9-11 cr)

_____ ( )
_____ ( )
_____ ( )
_____ ( )
_____ ( )
_____ ( )
_____ ( )
_____ ( )
_____ ( )

List Program Electives (18 cr)

_____ ( )
_____ ( )
_____ ( )
_____ ( )
_____ ( )
_____ ( )
_____ ( )
_____ ( )
_____ ( )

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About Electives: The Geology BS requires 18 credits of program electives and 9-11 credits of free electives. A **program elective** is any course with a GEOL or GEOE prefix. **At least 9 of the 18 program elective credits must be taken from 400-level courses.** A **free elective** may be any course accepted by SDSMT toward undergraduate credit, including GEOL or GEOE courses above the 18 credits needed to satisfy the program elective requirement. The lists below provides program and free elective recommendations for students wishing to focus on a specific career objective. Electives may be chosen from one focus area or across several areas.

Recommended Electives by Focus Area

Energy and Mineral Resources
Free electives
MEM 120 Introduction to Mining
MEM 201L Mine Surveying
MEM 204 Surface Mining
MEM 301 Computer Applications in Mining
MEM 307 Mineral Exploration and Geostatistics
MET 220 Mineral Processing
POLS 407 Environmental Law & Policy
Program electives
GEOE 324 Engineering Geophysics I
GEOE 461 Petroleum Drilling and Production
GEOE 466 Engineering/Environmental Geology
GEOL 351 Earth Resources and the Environment**
GEOL 403 Regional Field Geology
GEOL 420 Introduction to Remote Sensing
GEOL 422 Tectonics and Sed. Basin Analysis**
GEOL 442 Optical Petrology**
GEOL 450 Fluid and Thermal Diffusion**
GEOL 451 Economic Geology**
GEOL 476 Petroleum Geology**

Note: A Minor in Petroleum Systems is also offered; consult the requirements in the catalog.

Paleontology
Free electives
AES 403 Biogeochemistry**
AES/BIOL 406 Global Environmental Change
BIOL 121/L Anatomy
BIOL 123 Physiology
BIOL 151 General Biology I
BIOL 153 General Biology II
BIOL 311 Principles of Ecology
Program electives
GEOE 482 Applied Geomorphology**
GEOL 361 Oceanography**
GEOL 372 Dinosaurs
GEOL 403 Regional Field Geology
GEOL 471 Field Paleontology
GEOL 472 Museum Collections Management**
GEOL 473 Museum Exhibit Design**
GEOL 474 Paleontological Resource Management**
GEOL 475 Vertebrate Fossil Prep./Conservation

** Offered alternate years. Consult the SDSM&T course catalog for specific course offerings.

Environmental Geology
Free electives
AES 201 Introduction to Atmospheric Sciences
AES 403 Biogeochemistry
ATM/BIOL 406 Global Environmental Change
BIOL 311 Principles of Ecology
BIOL 331 Microbiology
POLS 407 Environmental Law & Policy
Program electives
GEOE 324 Engineering Geophysics I
GEOE 466 Engineering/Environmental Geology
GEOE 475 Groundwater
GEOE 482 Applied Geomorphology**
GEOL 351 Earth Resources and the Environment**
GEOL 361 Oceanography
GEOL 403 Regional Field Geology
GEOL 420 Introduction to Remote Sensing
GEOL 450 Fluid and Thermal Diffusion**

Geospatial Technology
Free electives
CSC 250 Computer Science II
CEE 437 Watershed and Floodplain Modeling
MEM 201 Mine Surveying
MEM 301/301L Computer Applications in Mining
Program electives
GEOE 482 Applied Geomorphology**
GEOL 417 Geospatial Databases
GEOL 419 Advanced Geospatial Analysis
GEOL 420 Introduction to Remote Sensing

Note: A Minor in Geospatial Technology is also offered; consult the requirements in the catalog.

Geomathematics
Free electives
MATH 321 Differential Equations
MATH 315 Linear Algebra
MATH 353 Linear Optimization
MATH 382 Probability Theory and Statistics II
MATH 451 Math Modeling
Program electives
GEOE 324 Engineering Geophysics I
GEOE 475 Groundwater
GEOL 419 Advanced Geospatial Analysis
GEOL 450 Fluid and Thermal Diffusion**