

B.S. in Geology - Effective Fall 2019

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

FRESHMAN YEAR		
<i>First Semester</i>		
__ CHEM 112	General Chemistry	(3-0) 3
__ CHEM 112L	Exper. Gen. Chemistry I	(0-1) 1
__ ENGL 101	Composition I ¹	(3-0) 3
__ GEOL 201	Physical Geology	(3-0) 3
__ GEOL 201L	Physical Geology Lab	(0-1) 1
__ GEOL 110L	Intro. to GGE and MEM	<u>(0-1) 1</u>
		12

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

<i>Second Semester</i>		
__ 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		<u>6</u>
		14

SOPHOMORE YEAR		
<i>First Semester</i>		
__ PHYS 211/A	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 111 Intro. Comp. Prog ⁷ or CSC 150 Comp. Sci. I or CSC 170 Programming for Eng. Sci.	(2-0) 2 (2-1) 3 (2-1) 3
__ Gen Ed Humanities/Social Science Elective ¹		<u>3</u>
		15-16

<i>Second Semester</i>		
__ PHYS 213/A	Univ. Physics II	(3-0) 3
__ One of	MATH 225 Calculus III ³ or MATH 381 Intro. to Statistics ^{3,7}	(4-0) 4 (3-0) 3
__ ENGL 279	Technical Communications I ¹	(3-0) 3
__ GEOL 212/L Mineral. and Crystallog. ²		(2-1) 3
__ Gen Ed Humanities/Social Science Elective ¹		<u>3</u>
		15-16

JUNIOR YEAR		
<i>First Semester</i>		
__ GEOL 331/L	Stratig. and Sedimentation ²	(2-1) 3
__ GEOL 341/L Intro. to Ign/Met Petrology ²		(2-1) 3
__ GEOL 416/L	Introduction to GIS ²	(2-1) 3
__ ENGL 289	Technical Communications II ¹	(3-0) 3
__	Program Elective ⁴	<u>3</u>
		15

<i>Second Semester</i>		
__ GEOL 322/L Structural Geology ²		(2-1) 3
__ GEOL 461/L	Invert. Paleontology ²	(2-1) 3
__ One of	GEOE 324 Eng. Geophysics# or GEOE 482/L App. Geomorph.*#	(2-1) 3 (2-1) 3
__	Program Electives ⁴	3
__	Free Elective ⁵	<u>3</u>
		15

JUNIOR YEAR (continued)		
<i>Summer</i>		
__ GEOL 410	Field Geology ²	<u>(0-6) 6</u>
		6

SENIOR YEAR		
<i>First Semester</i>		
__ GEOL 464	Senior Research I ²	(1-0) 1
__	Program Electives ⁴	6
__	Free Elective ⁵	3
__	Humanities/Social Sciences Elective	<u>3</u>
		13

<i>Second Semester</i>		
__ GEOL 465	Senior Research II ^{2,6}	(0-3) 3
__	Program Electives ⁴	6
__	Free Electives ⁵	<u>4-6</u>
		13-15

120 semester credits are required for graduation.

*Course offered in alternate years.

[†]Students must take at least one of these two courses (GEOE 324/324L, GEOE 482/482L). If both are taken, the second may serve as a program elective.

Bold=Critical sequence must be taken in the specified semester.

Curriculum Notes

¹ Students must complete 30 cr of the general education core including 6 cr of science (with at least 1 cr lab), 3 cr of math, 9 cr of writing/communication, 6 cr of humanities, and 6 cr of social sciences. An additional 3 cr of humanities/social sciences electives are required for the geology major. ENGL 279 and 289 are recommended English courses for the Geology major. GE courses must be chosen from an approved list in the university catalog.

² A grade of C or better is required in these courses for graduation with a Geology B.S. degree. Check prerequisite requirements on course descriptions.

³ Students should consult their academic advisor when choosing their third required math course.

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 Free electives are courses with any prefix that are approved by the academic advisor.

⁶ Under exceptional circumstances, a student may petition the department head to substitute geology electives for GEOL 465; however, all students must pass GEOL 464 with a grade of C or better.

⁷ Students must also take one (1) additional free elective credit to reach the 120 credits required for graduation.

Electives Worksheet (see reverse for list of recommended electives by semester and career focus area).

Goal 3 Social Sci Electives (6 cr)	Free Electives (10-12 cr)	Program Electives (18 cr)
_____ ()	_____ ()	_____ ()
_____ ()	_____ ()	_____ ()
Goal 4 Hum Electives (6 cr)	_____ ()	_____ ()
_____ ()	_____ ()	_____ ()
_____ ()	_____ ()	_____ ()
Additional Hum/SS Electives (3 cr)	_____ ()	_____ ()
_____ ()	_____ ()	_____ ()

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About Electives: The Geology BS requires 18 credits of program electives and 10-12 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 provide 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 Semester & Focus Areas

RECOMMENDED ELECTIVES BY SEMESTER & FOCUS AREA			
Focus Area(s)	FREE ELECTIVES BY SEMESTER	Focus Area(s)	PROGRAM ELECTIVES BY SEMESTER
	Every Fall and Spring		Every Fall and Spring
4	CSC 150 Computer Science I	1,4	GEOE 201L Surveying for Mining and Geol. Eng.
4,6	CSC 170/L Programming for Eng. & Scientists	3,4,5	GEOE 475/L Groundwater
4,6	CSC 215 Programming Techniques		Every Fall
5	MATH 315 Linear Algebra	1,3	GEOE 466/L Engineering/Environmental Geology
5	MATH 321 Differential Equations (+every summer)	4,6	GEOL 419 Advanced Geospatial Analysis
	Every Fall	1,3,4,6	GEOL 420 Introduction to Remote Sensing
2	BIOL 151 General Biology I		Every Spring
2	BIOL 121/L Basic Anatomy	1,3,5,6	GEOE 324/L Engineering Geophysics I
2,3	BIOL 311/L Principles of Ecology	1	GEOE 461 Petroleum Drilling and Production Eng.
3	BIOL 331 Microbiology	2	GEOL 372 Dinosaurs
4	CEE 437 Watershed and Floodplain Modeling	4,6	GEOL 417 Geospatial Databases
4,6	CSC 111/L Introduction to Computer Programming	2	GEOL 475/L Vertebrate Fossil Prep./Conservation
1,4	MEM 301/L Computer Applications in Mining	1	GEOL 476 Petroleum Geology
1,3	POLS 407 Environmental Law & Policy		Fall- Even Years Only
	Every Spring	1	GEOE 462/L Well Log Analysis
2,3	AES/BIOL 406 Global Environmental Change	1,6	GEOL 422/L Tectonics and Sed. Basin Analysis
2	BIOL 153 General Biology II	2	GEOL 474 Paleontological Res. Management
2	BIOL 326 Biomedical Physiology		Spring- Even Years Only
5,6	MATH 382 Probability Theory and Statistics II	1,3,5	GEOE 467 Introduction to Geomechanics
1	MEM 120 Introduction to Mining	2,3	GEOL 435 Geomicrobiology
1	MEM 204 Surface Mining Methods and Unit Op.	1	GEOL 451/L Economic Geology
1	MET 220/L Mineral Processing and Res. Recovery	2	GEOL 473/L Museum Exhibit Design
1	MEM 307 Mineral Exploration and Geostatistics		Spring- Odd Years Only
	Fall- Even Years Only	2,3,4,6	GEOE 482/L Applied Geomorphology
3	AES 201 Introduction to Atmospheric Sciences	1,3	GEOL 351 Earth Resources and the Environment
2,3	AES 403 Biogeochemistry	1,5,6	GEOL 444 Orogenic Systems (new course 2020-21)
	Spring- Even Years Only		Fall- Odd Years Only
5	MATH 451 Math Modeling	3,6	GEOL 421 Aqueous Geochemistry
		1,5,6	GEOL 456 Global Geophysics
		2	GEOL 472/L Museum Collections Management
	Key for Focus Areas		Every Summer
	1 Energy and Mineral Resources		
	2 Paleontology		
	3 Environmental Geology	1,3,6	GEOL/GEOE 412 Science and Eng. Field App.
	4 Geospatial Technology	2	GEOL 471 Field Paleontology
	5 Geomathematics		
	6 Solid Earth and Tectonics		