

# B.S. in Geology

## Effective Fall 2014

Students with this degree are well prepared to take advantage of career opportunities in petroleum or mineral industries, environmental geology, or paleontology resource management. Students are encouraged to choose electives emphasizing one of these three areas depending on their career interests. It also provides 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		
<i>First Semester</i>		
__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.

<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 <sup>1</sup>	_____6
		14

SOPHOMORE YEAR		
<i>First Semester</i>		
__PHYS 211	Univ. Physics I	(3-0) 3
__MATH 125	Calculus II	(4-0) 4
__GEOL 323	Search for Our Past <sup>2</sup>	(3-0) 3
__	Free Elective	3
__	Gen Ed Humanities/Social Science Elective <sup>1</sup>	_____3
		16

<i>Second Semester</i>		
__PHYS 213	Univ. Physics II	(3-0) 3
__ One of	MATH 225 Calculus III <sup>3</sup>	(4-0) 4
__	MATH 381 Intro to Statistics	(3-0) 3
__ENGL 279	Technical Communications I <sup>1</sup>	(3-0) 3
__GEOL 212	<b>Mineral. and Crystallog.</b> <sup>2</sup>	(2-1) 3
__	Gen Ed Humanities/Social Science Elective <sup>1</sup>	_____3
		15-16

JUNIOR YEAR		
<i>First Semester</i>		
__GEOL 331	Stratig. and Sedimentation <sup>2</sup>	(2-1) 3
__GEOL 341	<b>Intro to Ign/Met Petrology</b> <sup>2</sup>	(2-1) 3
__GEOL 416	Introduction to GIS <sup>2</sup>	(2-1) 3
__	Geology Elective <sup>4</sup>	3
__ENGL 289	Technical Communications II <sup>1</sup>	_____3
		15

<i>Second Semester</i>		
__GEOL 322	<b>Structural Geology</b> <sup>2</sup>	(2-1) 3
__GEOL 461	Invert. Paleontology <sup>2</sup> **	(2-1) 3
__ One of	GeoE 324 Eng Geophysics	
__	GeoE 482 Applied Geomorph**	(2-1) 3
__	Geology Elective <sup>4</sup>	3
__	Free Elective	_____3
		15

<i>Summer</i>		
__GEOL 410	<b>Field Geology</b> <sup>2</sup>	(0-6) 6
		6

SENIOR YEAR		
<i>First Semester</i>		
__GEOL 464	<b>Senior Research I</b> <sup>2</sup>	(1-0) 1
__	Geology Electives <sup>4</sup>	6
__	Free elective	3
__	Humanities/Social Science elective	_____3
		13

<i>Second Semester</i>		
__GEOL 465	<b>Senior Research II</b> <sup>2,5</sup>	3
__	Geology Electives <sup>4</sup>	6
__	Free electives	_____3-4
		12-13

120 semester credits are required.

\*\*Course offered in alternate years.

**Critical sequence, must be taken in the specified semester.**

### Curriculum Notes

<sup>1</sup> 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.

<sup>2</sup> A grade of C or better is required in these courses for graduation with a Geology B.S.

<sup>3</sup> Students should consult an advisor when choosing math courses.

<sup>4</sup> Geology electives must have a GEOL or GEOE prefix. At least 9 credits must be taken from 400-level courses.

Substitutions must be approved by the department head.

<sup>5</sup> 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 GE Hum Electives (6 cr)\*

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

#### List GE Social Sci Electives (6 cr)\*

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

#### List Hum/SS Electives (3 cr)

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

#### List Free Electives (12-13 cr)

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

#### List Geology Electives (18 cr)

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

\_\_\_\_\_ ( )  
 \_\_\_\_\_ ( )

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

# B.S. in Geology

Effective Fall 2014

**About Electives:** The BS in Geology requires 18 credits of geology electives and 12-13 credits of free electives. A **geology elective** is any course beginning with a GEOL or GEOE prefix. At least 9 credits of geology electives must come from courses at the 400-level. 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 geology elective requirement. The lists below provide guidance on recommended geology and free electives for students wishing to focus on a specific career objective. Electives may be chosen from one focus area or spread across several areas.

## Recommended Electives by Focus Area

### 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

#### *Geology electives*

GEOE 451 Economic Geology\*\*  
GEOE 466 Engineering/Environmental Geology  
GEOL 351 Earth Resources and the Environment\*\*  
GEOL 403 Regional Field Geology  
GEOL 420 Introduction to Remote Sensing  
GEOL 442 Optical Petrology\*\*

### Paleontology

#### *Free electives*

ATM 403 Biogeochemistry\*\*  
ATM 406 Global Environmental Change\*\*  
BIOL 121/L Anatomy  
BIOL 151 General Biology I  
BIOL 123 Physiology  
BIOL 153 General Biology II  
BIOL 311 Principles of Ecology  
*Geology electives*  
GEOL 361 Oceanography\*\*  
GEOL 471 Field Paleontology  
GEOL 403 Regional Field Geology  
GEOL 372 Dinosaurs  
GEOL 472 Museum Collections Management\*\*  
GEOL 473 Museum Exhibit Design\*\*  
GEOL 474 Paleontological Resource Management

### Petroleum Geology

#### *Free electives*

POLS 407 Environmental Law & Policy  
*Geology electives*  
GEOE 324 Engineering Geophysics I#  
GEOE 461 Petroleum Drilling and Production  
Engineering  
GEOL 351 Earth Resources and the Environment\*\*  
GEOL 403 Regional Field Geology  
GEOL 420 Introduction to Remote Sensing  
GEOL 442 Optical Petrology\*\*  
GEOL 476 Petroleum Geology\*\*

### Environmental Geology

#### *Free electives*

ATM 301 Introduction to Atmospheric Sciences  
ATM 403 Biogeochemistry  
ATM/BIOL 406 Global Environmental Change\*\*  
BIOL 311 Principles of Ecology  
BIOL 331 Microbiology  
POLS 407 Environmental Law & Policy  
*Geology electives*  
GEOE 324 Engineering Geophysics I#  
GEOL 361 Oceanography  
GEOL 403 Regional Field Geology  
GEOE 466 Engineering/Environmental Geology  
GEOE 475 Ground Water  
GEOE 482 Applied Geomorphology\*\* #  
GEOL 351 Earth Resources and the Environment\*\*  
GEOL 420 Introduction to Remote Sensing

### Geospatial Technology

#### *Free electives*

CSC 111 Introduction to Computer Programming  
CSC 150 Computer Science I  
CSC 250 Computer Science II  
CEE 437 Watershed and Floodplain Modeling  
MEM 201 Mine Surveying  
MEM 301/301L Computer Applications in Mining  
*Geology electives*  
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 elsewhere in the catalog. Students taking GEOL 417, GEOL 419, and GEOL 420 as part of the geospatial minor will also receive credit towards geology electives for these courses. Students considering the geospatial minor should take GEOL 416 Intro to GIS by their junior spring.

\*\* Offered alternate years.

#Students must take at least one of these courses. If both are taken, the second may serve as a geology elective.

# B.S. in Geology

Effective Fall 2014

## Geology Electives by Semester

*Actual offerings may vary due to changes in scheduling and/or enrollments.  
Consult other departments or WebAdvisor for schedules of free electives.*

<i>Fall Odd Year</i>	<i>Spring Even Year</i>
<p><i>Every fall</i> GEOE 475 Ground Water GEOE 466 Engineering/Environmental Geology GEOL 419 Advanced Geospatial Analysis GEOL 420 Introduction to Remote Sensing</p> <p><i>Odd years only</i> GEOL 351 Earth Resources and the Environment GEOL 361 Oceanography GEOL 473 Museum Exhibit Design</p>	<p><i>Every spring</i> GEOE 324 Engineering Geophysics I GEOE 461 Petroleum Drilling and Production Eng. GEOE 475 Ground Water GEOL 372 Dinosaurs GEOL 417 Geospatial Data</p> <p><i>Even years only</i> GEOL 442 Optical Petrology GEOL 472 Museum Collections Management</p>
<i>Fall Even Year</i>	<i>Spring Odd Year</i>
<p><i>Every fall</i> GEOE 475 Ground Water GEOE 466 Engineering/Environmental Geology GEOL 419 Advanced Geospatial Analysis GEOL 420 Introduction to Remote Sensing</p> <p><i>Even years only</i> GEOL 474 Paleontology Resource Management</p>	<p><i>Every spring</i> GEOE 324 Engineering Geophysics I GEOE 461 Petroleum Drilling and Production Engineering GEOE 475 Ground Water GEOL 372 Dinosaurs GEOL 417 Geospatial Data</p> <p><i>Odd years only</i> GEOE 451 Economic Geology GEOE 482 Applied Geomorphology GEOL 476 Petroleum Geology</p>

### *Summer semester electives*

GEOL 471 Field Paleo  
GEOL 412 Science and Engineering Field Applications

### *Occasional Spring semester elective*

GEOL 403 Regional Field Geology