

**COLLEGE OF SCIENCE**  
**Bachelor of Science**  
**Geosciences**  
**Geochemistry Option**  
**For students graduating in calendar year 2018**

**CURRICULUM FOR LIBERAL EDUCATION (CLE) REQUIREMENTS**

(CLE) requirements and approved courses are available online:

<http://www.cle.prov.vt.edu/guides/index.html>

(credit hours in parentheses)

**Writing and Discourse** (Area 1: 6 credits)

(ENGL 1105-1106 Freshman English)

(3)\_\_\_

(3)\_\_\_

**Ideas, Cultural Traditions, and Values** (Area 2: 6 credits required)

(Select from approved CLE courses)

(3)\_\_\_

(3)\_\_\_

**Society and Human Behavior** (Area 3: 6 credits required)

(Select from approved CLE courses)

(3)\_\_\_

(3)\_\_\_

**Scientific Reasoning and Discovery** (Area 4)

(Area fulfilled by GEOS 1004 and GEOS 1014)

**Quantitative and Symbolic Reasoning** (Area 5)

(Area fulfilled by MATH 1225 and MATH 1226)

**Creativity and Aesthetic Experience** (Area 6: 3 credits required)

(Select from approved CLE courses; must be a three-credit course)

(3)\_\_\_

**Critical Issues in a Global Context** (Area 7: 3 credits required)

(Area fulfilled by GEOS 1024)

**CLE credit hour requirement:**

**21 credits**

**College of Science Foreign Language Requirement:**

The requirement may be fulfilled by successful completion of one of the following:

1. The third year (level III) of one foreign language in high school.
2. Take equivalent of an 1106 foreign language at an accredited university or community college.

Note: A student who has not completed two (2) units of a single foreign language in high school must earn six (6) semester hours of college level credit in a foreign language (i.e., both 1105 and 1106). These six hours are in addition to the 120 hours required for graduation.

3. Credit by examination for a foreign language. The credit by exam option is available only to student who have gained knowledge of a foreign language without the benefit for formal training.
4. Students whose native language is not English may be exempted from the foreign language through demonstrating satisfactory knowledge of the foreign language as prescribed by the Department of Foreign Languages. (No credit is granted).

## COLLEGE AND DEPARTMENT REQUIREMENTS

### Geoscience Courses (45 credits)

GEOS 1004	Physical Geology	(3)___	
GEOS 1014	Earth & Life Through Time	(4)___	
GEOS 1024	Resources Geology & the Environment	(3)___	
GEOS 1104	Physical Geology Lab	(1)___	
GEOS 1124	Resources Geology & the Environment Lab	(1)___	
GEOS 2004	Geoscience Fundamentals <sup>2</sup>	(3)___	
GEOS 2444	Geoscience Field Observation <sup>2</sup>	(2)___	
GEOS 3104	Elementary Geophysics <sup>2</sup>	(3)___	
GEOS 3204	Sedimentology Stratigraphy <sup>1</sup>	(3)___	
GEOS 3404	Elements of Structural Geology <sup>1</sup>	(3)___	
GEOS 3504	Mineralogy <sup>1</sup>	(3)___	
GEOS 3604	Paleontology <sup>2</sup>	(3)___	
GEOS 3704	Igneous & Metamorphic Rocks <sup>2</sup>	(3)___	
GEOS 4024	Senior Seminar <sup>2</sup>	(3)___	
GEOS 4634	Environmental Geochemistry <sup>1</sup>	(3)___	
GEOS 4974	Independent Study <sup>3</sup>	(4)___	

### Mathematics Courses (19-20 credits)

MATH 1114 or	Elementary Linear Algebra	(2)___	
MATH 2114	Introduction to Linear Algebra	(3)___	
MATH 1225 - 1226	Calculus of a Single Variable	(4)___	(4)___
MATH 2204	Introduction Multivariable Calculus	(3)___	
MATH 2214	Introduction to Differential Equations	(3)___	
STAT 3005	Statistical Methods	(3)___	

### Natural Science Courses (33 credits)

CHEM 1035 - 1036	General Chemistry	(3)___	(3)___
CHEM 1045 - 1046	General Chemistry Lab	(1)___	(1)___
CHEM	Elective <sup>4</sup>	(3)___	(3)___
		(3)___	(1)___
PHYS 2305 - 2306	Foundations of Physics I and Lab	(4)___	(4)___
Science	Elective <sup>5</sup>	(3)___	(3)___
		(1)___	

### Free Electives (1-2 credits)

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**College and department credit hour requirement:**

**99 credits**

**Total to complete degree**

**120 credits**

<sup>1</sup>Taught only during fall semester

<sup>2</sup>Taught only during spring semester

<sup>3</sup>Registration requires an overall GPA of 2.5 or above

<sup>4</sup>Select from CHEM 2114, 2124, 2514, 2535, 2536, 2545, 2546, 3124, 3615, 3625, 4615, or 4616

<sup>5</sup>Choose from any 3-4000 level course from Biochemistry, Biological Sciences, Chemical Engineering, Chemistry, Civil Engineering, Computer Science, Crop and Soil Environmental Sciences, Engineering Science and Mechanics, Geosciences, Materials Science and Engineering, Mathematics, Mining and Minerals Engineering, Physics, or Statistics.

**Credit hours and GPA requirements:** Graduation requires completion of a minimum of 120 credit hours with a GPA of 2.0 or greater for all hours attempted. In addition, students must have an in-major GPA of 2.5 or greater. The in-major GPA is calculated from all geosciences courses.

**Prerequisites:** This check sheet has no hidden prerequisites, although some of the courses listed are prerequisites for other courses. Please see your advisor or consult the Undergraduate Course Catalog for more information.

**Substitutions:**

CHEM 1035H/1036H Honors General Chemistry for CHEM 1035/1036 General Chemistry

ENGL 1204H Honors Freshman English for ENGL 1106 Freshman English

COMM 1015/1016 Communication Skills for ENGL 1105/1106 Freshman English

MATH 1114H Honors Elementary Linear Algebra for MATH 1114 Linear Algebra

MATH 2114H Honors Introduction to Linear Algebra for MATH 2114 Introduction to Linear Algebra

MATH 2214H Honors Introduction to Differential Equations for MATH 2214 Differential Equations

STAT 3615/3616 Biological Statistics for STAT 3005 Statistical Methods

**Satisfactory progress towards degree:**

1. By 72 hours students must have completed the following courses and their prerequisites:  
GEOS 1004, 1014, 1104, 2004, 3404, 3504, 3704  
MATH 1114 or 2114, 1225, 1226, 2204, 2214  
CHEM 1035, 1036, 1045, 1046, electives
2. Students must achieve an overall GPA of 2.0 and an in-major GPA of 2.5 upon attempting 15 GEOS credit hours (including transfer credit, courses completed with a grade of “W”, advance placement, or IB credit).
3. All GEOS courses will be used to calculate in-major GPA.

<b>Geochemistry Option</b>			
<b>Courses</b>		<b>Prerequisites</b>	<b>Co requisites</b>
GEOS 1004	Physical Geology	None	None
GEOS 1014	Earth & Life Through Time	None	None
GEOS 1024	Resources Geology & the Environment	None	None
GEOS 1104	Physical Geology Lab	None	None
GEOS 1124	Resources Geology & the Environment Lab	None	None
GEOS 2004	Geosciences Fundamentals	(Geos 1004, 1014) or (1004, 1024) or (1004, 1034) or (1014, 1024) or (1014, 1034) or (1024, 1034)	None
GEOS 2444	Geoscience Field Observations	1004, 1014, 1104	None
GEOS 3104	Elementary Geophysics	Math 1205 or 1225, 1206 or 1226, GEOS 1004 or 2104, Phys 2305	Phys 2306
GEOS 3204	Sedimentology Stratigraphy	1004 or 1014	None
GEOS 3404	Elements of Structural Geology	1004	None
GEOS 3504	Mineralogy	(Math 1205 or 1225), Chem 1036	None
GEOS 3604	Paleontology	1004, 1014	None
GEOS 3704	Igenous & Metamorphic Rocks	1004, 1014	3504
GEOS 4024	Senior Seminar	3104, 3204, 3404, 3504, 3604, 3704	None
GEOS 4634	Environmental Geochemistry	(Math 1205 or 1225), Chem 1036	None
GEOS 4974	Independent Study	None	None
MATH 1114 or	Elementary Linear Algebra	None	None
MATH 2114	Introduction to Linear Algebra	Math 1225 or 1226	None
MATH 1225	Calculus of a Single Variable	None	None
MATH 1226	Calculus of a Single Variable	Math 1225	None
MATH 2204	Introduction Multivariable Calculus	Math 1226	None
MATH 2214	Introduction to Differential Equations	(Math 1114 or 1114H or 2114 or 2114H), (1206 or 1206H or 1226 or 2015 or 1026)	None
STAT 3005	Statistical Methods	Math 1206 or 1226	None
CHEM 1035	General Chemistry	None	None
CHEM 1036	General Chemistry	Chem 1035 or 1055 or 1055H	None
CHEM 1045	General Chemistry Lab	None	Chem 1035
CHEM 1046	General Chemistry Lab	Chem 1045 or 1065	Chem 1036
CHEM	Specific Electives	Varies	Varies
PHYS 2305	Foundations of Physics I and Lab	(Math 1205 or 1205H or 1225) or (1206 or 1206H or 1226)	Math 1206, Phys 2325
PHYS 2306	Foundations of Physics I and Lab	(Math 1206 or 1206H or 1226), Phys 2305	None
Science	Free Electives	Varies	Varies