

COLLEGE OF SCIENCE
Bachelor of Science
Geosciences
Geophysics 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)

(Select from approved CLE courses)

(3)___

CLE credit hour requirement:

24 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 (48 credits)

| | | | |
|-----------|--|--------|--|
| GEOS 1004 | Physical Geology | (3)___ | |
| GEOS 1014 | Earth & Life Through Time | (4)___ | |
| GEOS 1104 | Physical Geology Lab | (1)___ | |
| GEOS 2004 | Geoscience Fundamentals ² | (3)___ | |
| GEOS 2444 | Geoscience Field Observation ² | (2)___ | |
| GEOS 3104 | Elementary Geophysics ² | (3)___ | |
| GEOS 3204 | Sedimentology Stratigraphy ¹ | (3)___ | |
| GEOS 3404 | Elements of Structural Geology ¹ | (3)___ | |
| GEOS 3504 | Mineralogy ¹ | (3)___ | |
| GEOS 3604 | Paleontology ² | (3)___ | |
| GEOS 3704 | Igneous & Metamorphic Rocks ² | (3)___ | |
| GEOS 4024 | Senior Seminar ² | (3)___ | |
| GEOS 4xxx | Elective ⁸ | (3)___ | |
| GEOS 4154 | Earthquake Seismology ⁴ | (3)___ | |
| GEOS 4164 | Potential Field Methods in Exploration Geophysics ⁵ | (4)___ | |
| GEOS 4174 | Exploration Seismology ⁶ | (4)___ | |

Mathematics Courses (22-23 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)___ | |
| CS 1044 | Introduction to Programming in C | (3)___ | |
| STAT 3005 | Statistical Methods | (3)___ | |

Natural Science Courses (22 credits)

| | | | |
|------------------|----------------------------------|--------|--------|
| CHEM 1035 - 1036 | General Chemistry | (3)___ | (3)___ |
| CHEM 1045 - 1046 | General Chemistry Lab | (1)___ | (1)___ |
| PHYS 2305 - 2306 | Foundations of Physics I and Lab | (4)___ | (4)___ |
| Science/Math | Elective ⁷ | (3)___ | (3)___ |

Free Electives (3-4 credits)

College and department credit hour requirement:

96 credits

Total to complete degree

120 credits

¹Taught only during fall semester

²Taught only during spring semester

³Taught even years during spring semester

⁴Taught odd years during spring semester

⁵Taught odd years during fall semester

⁶Taught even years during fall semester

⁷Select from GEOS 4XXX, MATH 4564 Operational Methods for Engineers, MATH 4574 Vector and Complex Analysis for Engineers, and PHYS 3XXX-4XXX. Maximum of 4 credits combined from GEOS 4974 Independent Study and GEOS 4994 Undergraduate Research.

⁸or advisor approved substitution

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

CS 1344 Programming in C for CS 1044 Introduction to Programming in C

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

Satisfactory progress towards degree:

1. By 72 hours students must have completed the following courses and their prerequisites:
 GEOS 1004, 1014, 1104, 2004, 3104, 3404, 3504
 MATH 1114 or 2114, 1225, 1226, 2204, 2214
 CHEM 1035, 1036, 1045, 1046
 PHYS 2305, 2306
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.

| Geophysics Option | | | |
|--------------------------|---|---|----------------------|
| Courses | | Prerequisites | Co requisites |
| GEOS 1004 | Physical Geology | None | None |
| GEOS 1014 | Earth & Life Through Time | None | None |
| GEOS 1104 | Physical Geology Lab | None | None |
| GEOS 2004 | Geoscience 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 4xxx | Elective | Varies | Varies |
| GEOS 4154 | Earthquake Seismology | 3104, Math 2214, 2224, 2204 or 2204H, Phys 2305 | None |
| GEOS 4164 | Potential Field Methods in Exploration Geophysics | 3104, Math 2214, 2224, 2204 or 2204H, Phys 2306 | None |
| GEOS 4174 | Exploration Seismology | 3104, Math 2224, 2204 or 2204H, Phys 2305, 2306 | None |
| | | | |
| CS 1044 | Introduction to Programming in C | 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 |
| 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/Math | Electives | Varies | Varies |

