APPROVED
University Registrar

**College of Science**
**Department of Geosciences**
**Bachelor of Science in Geosciences (BS)**
**Geophysics Option**
**For students graduating in calendar year 2021**

## 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) (3)____ (3)____
(Select from approved CLE courses)

**Society and Human Behavior** (Area 3: 6 credits required) (3)_____ (3)____
(Select from approved CLE courses)

**Scientific Reasoning and Discovery** (Area 4)
(Area fulfilled by CHEM 1035 and CHEM 1036)

**Quantitative and Symbolic Reasoning** (Area 5)
(Area fulfilled by MATH 1225 and MATH 1226)

**Creativity and Aesthetic Experience** (Area 6: 3 credits required) (3)____
(Select from approved CLE courses; must be a three-credit course)

**Critical Issues in a Global Context** (Area 7: 3 credits required) (3)____
(Select from approved CLE courses)

**CLE credit hour requirement:** **24 credits**

## COLLEGE AND DEPARTMENT REQUIREMENTS

* indicates course with prerequisite(s) or corequisite(s) – please see chart on last page

**Geoscience Courses (48 credits)**

| | | | |
|---|---|---|---|
| GEOS 2004* | Geoscience Fundamentals[2] | (3)____ | |
| GEOS 2024 | Earth's Dynamic Systems[1] | (8)____ | |
| 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** |

[1]Taught only during fall semester
[2]Taught only during spring semester
[3]Taught even years during spring semester
[4]Taught odd years during spring semester
[5]Taught odd years during fall semester
[6]Taught even years during fall semester
[7]Select 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.
[8]or 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 2.0 or greater. The in-major GPA is calculated from all geosciences courses.

**Prerequisites:** This checksheet has no hidden prerequisites, although some of the courses listed are prerequisites for other courses. Please consult the Undergraduate Course Catalog for more information.

**Substitutions:**

CHEM 1055 or CHEM 1055H for CHEM 1035 and CHEM 1056 or CHEM 1056H for CHEM 1036
CHEM 1065/1066 for CHEM 1045/1046

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 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 2004, 2024, 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.

**Foreign Language Requirement:**
Students who did not successfully complete at least two years of a single foreign, classical, or sign language during high school must successfully complete six semester hours of a single foreign, classical, or sign language at the college level. Courses taken to meet this requirement do not count toward the hours required for graduation. Please consult the Undergraduate Catalog for details.

Course requirements are subject to change. Always check the Undergraduate Catalog for the most current prerequisite and corequisite information.

| Geophysics Option | | | |
|---|---|---|---|
| **Courses** | | **Prerequisites** | **Corequisites** |
| GEOS 2004 | Geosciences Fundamentals | GEOS 2024 | None |
| GEOS 2024 | Earth's Dynamic Systems | None | None |
| GEOS 2444 | Geoscience Field Observations | GEOS 2024 | None |
| GEOS 3104 | Elementary Geophysics | Math 1205 or 1225, 1206 or 1226, GEOS 2004, 2024, 2444, Phys 2305 | Phys 2306 |
| GEOS 3204 | Sedimentology Stratigraphy | GEOS 2004, 2024, 2444 | None |
| GEOS 3404 | Elements of Structural Geology | GEOS 2004, 2024, 2444 | None |
| GEOS 3504 | Mineralogy | Math 1205 or 1225, Chem 1036, GEOS 2004, 2024, 2444 | None |
| GEOS 3604 | Paleontology | GEOS 2004, 2024, 2444 | None |
| GEOS 3704 | Igneous & Metamorphic Rocks | GEOS 2004, 2024, 2444, 3504 | None |
| GEOS 4024 | Senior Seminar | GEOS 3104, 3204, 3404, 3504, 3604, 3704 | None |
| GEOS 4xxx | Elective | Varies | Varies |
| GEOS 4154 | Earthquake Seismology | GEOS 3104, Math 2214, 2224 or 2204 or 2204H, Phys 2305 | None |
| GEOS 4164 | Potential Field Methods in Exploration Geophysics | GEOS 3104, Math 2214, 2224 or 2204 or 2204H, Phys 2306 | None |
| GEOS 4174 | Exploration Seismology | GEOS 3104, Math 2224 or 2204 or 2204H, Phys 2305, 2306 | None |
| CS 1044 | Introduction to Programming in C | None | None |
| MATH 1114 | 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 1226 | None |
| STAT 3005 | Statistical Methods | Math 1206 or 1225 | 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 | None |
| PHYS 2306 | Foundations of Physics I and Lab | Math 1206 or 1206H or 1226, Phys 2305 | None |
| Science/Math | Electives | Varies | Varies |