

# BACHELOR OF SCIENCE IN GEOLOGY

Students majoring in Geology may pursue the Bachelor of Science degree or the Bachelor of Arts degree.

The Bachelor of Science and the Bachelor of Arts in Geology degrees both prepare students for professional employment. The Bachelor of Science degree also prepares students for graduate study in geology and related fields. The dominant fields of employment include:

- environmental geology
- engineering geology
- hydrogeology
- geophysics
- government compliance and regulation
- mining
- petroleum geology
- other fields within the energy industry

The Bachelor of Science and the Bachelor of Arts degrees in Geology can be completed in eight semesters if students average 16 hours of coursework per semester.

## LEARNING OUTCOMES

The learning outcomes for the Bachelor of Science in Geology are as follows:

- Communicate effectively using the language, concepts, and models of geology in written, visual, and numerical formats.
- Properly apply the scientific method to research a geologic problem and formulate conclusions.
- Demonstrate ability to apply appropriate field- and laboratory-based methods (of acquiring, quantitatively and qualitatively analyzing, and interpreting geologic data and information).
- Demonstrate understanding of plate tectonics regarding the petrologic, stratigraphic, and structural evolution of continents and oceans.

For more information, visit the Department of Geological and Environmental Sciences.

The Bachelor of Science degree requires the successful completion of a minimum of 74 s.h. of core and elective courses. These courses include a Geology capstone experience of Geology Field Camp which is normally completed during summer following the junior year. Alternatively, students may opt for an internship (STEM 4890 STEM Internship) experience or a Senior Thesis research experience (GEOL 4830 Senior Thesis).

| COURSE   | TITLE                     | S.H. |
|--|---------------------------|------|
| <b>General Education Requirements</b>              |                           |      |
| Core Competencies                                  |                           | 12   |
| ENGL 1550  | Writing 1                 |      |
| ENGL 1551  | Writing 2                 |      |
| CMST 1545  | Communication Foundations |      |
| Mathematics Requirement                            |                           |      |
| Arts and Humanities                                |                           | 6    |
| Natural Science                                    |                           | 6    |
| Social Science                                     |                           | 6    |
| Social and Personal Awareness                      |                           | 6    |
| General Education Elective / First Year Experience |                           | 3    |
| <b>Major Requirements</b>                          |                           |      |

|                   |  |   |
|-------------------|--|---|
| GEOL 1505 & 1505L | Physical Geology and Physical Geology Laboratory   | 4 |
| ENST 2600 & 2600L | Foundations of Environmental Studies and Foundations of Environmental Studies Laboratory | 4 |
| GEOL 2605         | Historical Geology   | 4 |
| GEOL 3700         | Mineralogy   | 4 |
| GEOL 3701         | Geomorphology  | 3 |
| GEOL 3704 & 3704L | Structural Geology and Structural Geology Laboratory                                     | 3 |
| GEOL 3718         | Igneous and Metamorphic Petrology  | 4 |
| GEOL 3750         | Geoscience Seminar<br>(may be repeated up to four times)                                 | 1 |
| GEOL 5802         | Sedimentology and Stratigraphy   | 3 |
| GEOL 5810         | Geographic Information Science 1   | 3 |

| <b>Capstone Experience</b>   |                                  |   |
|------------------------------|----------------------------------|---|
| Select one of the following: |                                  | 4 |
| GEOL 48XX                    | Field Camp (4 s.h. minimum)      |   |
| STEM 4890                    | STEM Internship (4 s.h. maximum) |   |
| GEOL 4830                    | Senior Thesis                    |   |

| <b>Electives</b>   |   |    |
|--|---|----|
| Select a minimum 8 s.h. of Geology courses, 12 s.h. total: |   | 12 |
| ENST 3700 & 3700L  | Environmental Chemistry and Environmental Chemistry Lab |    |
| GEOL 3702  | Glacial Geology   |    |
| GEOL 3706  | Geology of Economic Mineral Deposits                    |    |
| GEOL 3709  | Subsurface Investigations                               |    |
| GEOL 3714  | Principles of Paleontology                              |    |
| GEOL 3716  | Environmental Impact of Abandoned Mines                 |    |
| ENST 3751 & 3751L  | Water Quality Analysis and Water Quality Analysis Lab   |    |
| GEOL 3720  | Field Investigations in Geology                         |    |
| ENST 3780  | Environmental Research                                  |    |
| ENST 3781  | Environmental Sampling Methods                          |    |
| GEOL 4804  | Ground Water  |    |
| GEOL 4824  | Tectonics   |    |
| GEOL 4825  | Geophysical Well Log Analysis                           |    |
| GEOL 4899  | Special Topics  |    |
| GEOL 5805  | Special Problems in Geology                             |    |
| ENST 5810  | Environmental Safety                                    |    |
| GEOL 5810  | Groundwater Resource Evaluation                         |    |
| GEOL 5811  | Geographic Information Science 2                        |    |
| GEOL 5815  | Geology and the Environment 2                           |    |
| GEOL 5817  | Environmental Geochemistry                              |    |
| ENST 5860  | Environmental Regulations                               |    |

| <b>Ancillary Science Courses</b>      |  |       |
|---------------------------------------|--|-------|
| Select 25-26 s.h. from the following: |  | 25-26 |
| CHEM 1515 & 1515L                     | General Chemistry 1 and General Chemistry 1 Laboratory             |       |
| CHEM 1516 & 1516L                     | General Chemistry 2 and General Chemistry 2 Laboratory             |       |
| MATH 1571 & MATH 1572 or STAT 3717    | Calculus 1 and Calculus 2 or Statistical Methods                   |       |
| PHYS 1501 & 1501L                     | Fundamentals of Physics 1 and Fundamentals of Physics Laboratory 1 |       |
| PHYS 1502 & 1502L                     | Fundamentals of Physics 2 and Fundamentals of Physics Laboratory 2 |       |

|                      |   |  |
|----------------------|---|--|
| PHYS 2610<br>& 2610L | General Physics 1<br>and General Physics laboratory 1 |  |
| PHYS 2611<br>& 2611L | General Physics 2<br>and General Physics laboratory 2 |  |

Total Prescribed Semester Hours: 113-114 s.h.

| Course                            | Title  | S.H.      |
|-----------------------------------|--|-----------|
| <b>Year 1</b>                     |  |           |
| <b>Fall</b>                       |  |           |
| GEOL 1505<br>& 1505L              | Physical Geology<br>and Physical Geology Laboratory  | 4         |
| ENGL 1550                         | Writing 1  | 3         |
| CHEM 1515<br>& 1515L              | General Chemistry 1<br>and General Chemistry 1 Laboratory                                      | 4         |
| GER Arts and Humanities Elective  |  | 3         |
| GEOL 3750                         | Geoscience Seminar   | 1         |
| <b>Semester Hours</b>             |  | <b>15</b> |
| <b>Spring</b>                     |  |           |
| GEOL 2605                         | Historical Geology   | 4         |
| ENGL 1551                         | Writing 2  | 3         |
| CHEM 1516<br>& 1516L              | General Chemistry 2<br>and General Chemistry 2 Laboratory                                      | 4         |
| GEOG 2626                         | World Geography  | 3         |
| GEOG 2611                         | Geospatial Foundations   | 3         |
| <b>Semester Hours</b>             |  | <b>17</b> |
| <b>Year 2</b>                     |  |           |
| <b>Fall</b>                       |  |           |
| GEOL 3700                         | Mineralogy   | 4         |
| MATH 1571                         | Calculus 1   | 4         |
| GEOG 5810                         | Geographic Information Science 1   | 3         |
| ENST 2600<br>& 2600L              | Foundations of Environmental Studies<br>and Foundations of Environmental Studies<br>Laboratory | 4         |
| GEOL 3750                         | Geoscience Seminar (Optional)  | 1         |
| <b>Semester Hours</b>             |  | <b>16</b> |
| <b>Spring</b>                     |  |           |
| GEOL 3718                         | Igneous and Metamorphic Petrology  | 4         |
| STAT 3717<br>or MATH 1572         | Statistical Methods<br>or Calculus 2   | 4         |
| GEOL/ENST Upper Division Elective |  | 3         |
| CMST 1545                         | Communication Foundations  | 3         |
| <b>Semester Hours</b>             |  | <b>14</b> |
| <b>Year 3</b>                     |  |           |
| <b>Fall</b>                       |  |           |
| GEOL 3701                         | Geomorphology  | 3         |
| PHYS 1501<br>& 1501L              | Fundamentals of Physics 1<br>and Fundamentals of Physics Laboratory 1                          | 5         |
| GER Social Science Elective       |  | 3         |
| GEOL/ENST Upper Division Elective |  | 3         |
| GEOL 3750                         | Geoscience Seminar (Optional)  | 1         |
| <b>Semester Hours</b>             |  | <b>15</b> |
| <b>Spring</b>                     |  |           |
| GEOL 3704<br>& 3704L              | Structural Geology<br>and Structural Geology Laboratory  | 3         |
| PHYS 1502<br>& 1502L              | Fundamentals of Physics 2<br>and Fundamentals of Physics Laboratory 2                          | 4         |
| GER Arts and Humanities           |  | 3         |
| GEOL/ENST Upper Division Elective |  | 3         |

|                       |                      |           |
|-----------------------|----------------------|-----------|
| ENST 5810             | Environmental Safety | 1         |
| <b>Semester Hours</b> |                      | <b>14</b> |

**Year 4****Fall**

|                                   |                               |   |
|-----------------------------------|-------------------------------|---|
| GEOL 3750                         | Geoscience Seminar (Optional) | 1 |
| GER Social Personal Awareness     |                               | 3 |
| GEOL/ENST Upper Division Elective |                               | 3 |
| GEOL/ENST Upper Division Elective |                               | 3 |
| Elective Course                   |                               | 3 |

**Semester Hours****13****Spring**

|                                   |   |   |
|-----------------------------------|---|---|
| GEOL 5802                         | Sedimentology and Stratigraphy                              | 3 |
| GEOL/ENST Upper Division Elective |   | 3 |
| GEOL/ENST Upper Division Elective |   | 3 |
| PHIL 2631                         | Environmental Ethics (GER Social and<br>Personal Awareness) | 3 |
| Elective Course                   |   | 3 |

**Semester Hours****15****Total Semester Hours****119**

| COURSE                             | TITLE   | S.H. |
|------------------------------------|---|------|
| <b>Capstone Experience Options</b> |   |      |
| GEOL 48XX                          | Geology Field Camp: Preferred (Summer Junior or<br>Senior Year) | 4-6  |
| STEM 4890                          | STEM Internship (Optional (Summer Junior or Senior<br>Year))    | 4    |
| GEOL 4830                          | Senior Thesis (Restricted)                                      | 4    |