BACHELOR OF SCIENCE IN GEOLGY

Geology exists as a science to satisfy the needs of modern society for earth's abundant natural resources and to ensure sustainable practices for future generations. The Department of Geological and Environmental Sciences offers two different geology degrees; the Bachelor of Arts and the Bachelor of Science. Both programs prepare graduates for employment, however the Bachelor of Science is considered the flagship degree as its more rigorous curriculum provides significant employment advantages and prepares graduates for admission to Master of Science and Doctor of Philosophy (PhD) programs. The dominant fields of employment include:

- Engineering geology
- Water resources
- Construction
- Hydrogeology
- Petroleum geology
- Environmental geology
- Geophysics
- Mining
- Government regulation and compliance work
- Employment related to the energy industry

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

For more information, visit the Department of Geological and Environmental Sciences (https://catalog.ysu.edu/undergraduate/colleges-programs/college-science-technology-engineering-mathematics/department-geological-environmental-sciences/)

The Bachelor of Science in Applied Geology degree requires the successful completion of a minimum of 91 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.
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FIRST YEAR REQUIREMENT - STUDENT SUCCESS
YSU 1500 | Success Seminar | 1-2
or SS 1500 | Strong Start Success Seminar | 
or HONR 1500 | Intro to Honors | 

General Education Requirements
ENGL 1550 | Writing 1 | 3-4
or ENGL 1549 | Writing 1 with Support | 
ENGL 1551 | Writing 2 | 3
CMST 1545 | Communication Foundations | 3
Mathematics Requirement (met with MATH in major)
Arts and Humanities (6 s.h.)
Natural Sciences (2 courses, 1 with lab) (6-7 s.h.)
Social Science (6 s.h.)
Social and Personal Awareness (6 s.h.)

Major Requirements
GEOL 1505 | Physical Geology | 4
ENST 2600 | Foundations of Environmental Studies | 4
& 2600L | and Foundations of Environmental Studies Laboratory | 
GEOL 2605 | Historical Geology | 4
GEOL 2600 | Geology in the Field | 1

GEOG 2611 | Geospatial Foundations | 3
GEOL 3711 | Mineralogy | 3
GEOL 3717 | Petrology | 3
GEOL 3705 | Structures and Landscapes | 4
GEOL 3708 | Geological Field Methods | 2
GEOL 3750 | Geoscience Seminar must be taken twice in fall terms for a total of 2 hours | 2
GEOL 3755 | Geological Research Methods and Data Analysis | 3
GEOL 5802 | Sedimentology and Stratigraphy | 3
GEOL 3701 | Introduction to Geographic Information Science | 3

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

Electives
Select a minimum 24 s.h. of Upper Division elective courses (at least 2 courses must be non GEOL): 24
- ENST 3700 Environmental Chemistry & 3700L and Environmental Chemistry Lab
- GEOL 3702 Glacial Geology
- GEOL 3706 Geology of Economic Mineral Deposits
- GEOL 3709 Subsurface Investigations
- GEOL 3710 Petroleum Geology of the Appalachian Basin
- GEOL 3714 Principles of Paleontology
- GEOL 3716 Environmental Impact of Abandoned Mines
- ENST 3751 Water Quality Analysis & 3751L 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 4806 Engineering Geology
- GEOL 4812 GIS Applications to Geology
- GEOL 4824 Tectonics
- GEOL 4825 Geophysical Well Log Analysis
- GEOL 4899 Special Topics
- GEOL 5805 Special Problems in Geology
- GEOL 5808 Introduction to Energy Resources
- GEOL 5810 Groundwater Resource Evaluation
- ENST 5810 Environmental Safety
- GEOL 4801 Advanced Geographic Information Science
- GEOL 5815 Geology and the Environment 2
- GEOL 5817 Environmental Geochemistry
- ENST 5860 Environmental Regulations

Ancillary Science Courses
- CHEM 1515 & 1515L General Chemistry 1 and General Chemistry 1 Laboratory
- CHEM 1516 & 1516L General Chemistry 2 and General Chemistry 2 Laboratory
- MATH 1570 Applied Calculus 1 or MATH 1571 Calculus 1
- STAT 3717 Statistical Methods or MATH 1572 Calculus 2
- PHYS 1501 Fundamentals of Physics 1 & 1501L and Fundamentals of Physics Laboratory 1
- GEOL 48XX Field Camp (4 s.h. minimum)
PHYS 1502 & 1502L
or PHYS 2611
Fundamentals of Physics 2 and Fundamentals of Physics Laboratory 2
General Physics 2
Total Prescribed Semester Hours: 120-122 s.h.

Total Semester Hours 120-122

Year 1

Fall
YSU 1500 or SS 1500
Success Seminar or Strong Start Success Seminar
1-2
GEOL 1505 & 1505L
Physical Geology and Physical Geology Laboratory
4
ENGL 1550 or ENGL 1549
Writing 1 or Writing 1 with Support
3-4
GEOL 2600
Geology in the Field
1
CHEM 1515 & 1515L
General Chemistry 1 and General Chemistry 1 Laboratory
4
Semester Hours 13-15

Spring
GEOL 2605
Historical Geology
4
ENGL 1551
Writing 2
3
GEOG 2626
World Geography
3
GEOG 2611
Geospatial Foundations
3
CHEM 1516 & 1516L
General Chemistry 2 and General Chemistry 2 Laboratory
4
Semester Hours 17

Year 2

Fall
GEOL 3711
Mineralogy
3
GEOG 3701
Introduction to Geographic Information Science
3
MATH 1570
Applied Calculus 1
4
PHIL 1565
Critical Thinking
3
Upper Division Elective
3
Semester Hours 16

Spring
GEOL 3717
Petrology
3
STAT 3717
Statistical Methods
4
Upper Division Elective
3
ENST 2600 & 2600L
Foundations of Environmental Studies and Foundations of Environmental Studies Laboratory
4
CMST 1545
Communication Foundations
3
Semester Hours 17

Year 3

Fall
GEOL 3708
Geological Field Methods
2
GEOL 3755
Geological Research Methods and Data Analysis
3
PHYS 1501 & 1501L
Fundamentals of Physics 1 and Fundamentals of Physics Laboratory 1
5
GEOL 3750
Geoscience Seminar
1
Upper Division Elective
3
PHIL 2625
Introduction to Professional Ethics
3
Semester Hours 17

Spring
PHYS 1502 & 1502L
Fundamentals of Physics 2 and Fundamentals of Physics Laboratory 2
4
GEOG 2650
Global Economic Landscapes
3
Upper Division Elective
3
ENST 5810
Environmental Safety (Recommended Upper Division Elective)
3
Semester Hours 13

Year 4

Fall
GEOG 3750
Geoscience Seminar
1
GER Social Personal Awareness
3
Upper Division Elective
3
Upper Division Elective
3
Upper Division Elective
4
Semester Hours 14

Spring
GEOG 3750
Geoscience Seminar
1
GEOG 5802
Sedimentology and Stratigraphy
3
Upper Division Elective
3
Upper Division Elective
3
Spa Gen Ed Elective Course
3
Semester Hours 13

Total Semester Hours 120-122

Learning Outcomes

The learning outcomes for the Bachelor of Science in Applied 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.