

ASSESSMENT REPORT 2014-2015

Environmental Geology
(Instructional Degree Program)

B.S.
(Degree Level)

Program Mission:

The mission of the Environmental Geology B.S. Program is to provide students with a rigorous, high-quality education in environmental geology.

Student Learning Outcome 1:

Classify and identify geologic materials, including soils, minerals, and rocks.

NMHU Traits Specifically Linked to Student Learning Outcome 1

- Mastery of Content Knowledge and Skills

First Means of Assessment for Outcome 1:

Lab midterm from GEOL: 101 Survey of Earth Science (Spring 2015) emphasizing hand specimen description and identification. Student mastery of geologic materials identification will be measured by achievement of a score of $\geq 70\%$ on the lab midterm.

Summary of Data:

Number of Students Meeting Criterion:	20	Number of Students Not Meeting Criterion:	8
Total Number of Students Assessed:	28	Percent of Students Meeting Criterion:	71.4%

Second Means of Assessment for Outcome 1:

Lab midterm and final from GEOL 202: Earth History which emphasize mineral, rock, and fossil identification and interpretation. Student mastery of geologic materials identification will be measured by achievement of a score of $\geq 70\%$ on the lab midterm and final examination.

Summary of Data:

Number of Students Meeting Criterion:		Number of Students Not Meeting Criterion:	
Total Number of Students Assessed:		Percent of Students Meeting Criterion:	%

GEOL 202 was not taught during 2014-15.

Interpretation of Results for Outcome 1:

A good number of students met the mineral and rock identification criterion, but the number could be better. The GEOL 101 team is considering increasing the number of hand specimen identification labs or reducing the total number of hand specimens introduced in each lab exercise so students have more time with selected samples to better observe, characterize, and classify each. The GEOL 101 team is also considering adding a required field trip to the course agenda, to increase the time and context students have for seeing and identifying rocks and thus, building and strengthening their identification skills.

Student Learning Outcome 2:

Read and evaluate relevant professional literature.

NMHU Traits Specifically Linked to Student Learning Outcome 2

- Critical and Reflective Thinking Skills

First Means of Assessment for Outcome 2:

Score of $\geq 70\%$ on GEOL 325: Earth Materials “Adopt-A-Mineral” project term paper.

Summary of Data

Number of Students Meeting Criterion:	8	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	8	Percent of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 2:

Score of $\geq 70\%$ on oral presentation of GEOL 325: Earth Materials “Adopt-A-Mineral” project.

Summary of Data:

Number of Students Meeting Criterion:	8	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	8	Percent of Students Meeting Criterion:	100%

Third Means of Assessment for Outcome 2:

Score of $\geq 70\%$ on combined oral presentation and term paper from GEOL 202: Earth History "rock project" paper and class presentation. (Note: the "rock project" is a semester-long project which requires students to collect an igneous, sedimentary, and metamorphic rock from northern New Mexico and write a geologic history of the area based on identifying the rock, understanding the process by which it formed, and placing it in the context of the regional geology.)

Summary of Data:

Number of Students Meeting Criterion:		Number of Students Not Meeting Criterion:	
Total Number of Students Assessed:		Percent of Students Meeting Criterion:	%

GEOL 202 was not taught during 2014-15.

Interpretation of Results for Outcome 2:

Environmental Geology majors do well with reading, writing, and reporting on advanced topics in geology. Note, though, that this comes with faculty putting initial time into structuring deadlines (submission of topic, preparing a detailed outline, submitting references and drafts, etc.) and meeting regularly with students to review work and provide editorial improvements.

Student Learning Outcome 3:

Effectively communicate scientific ideas, information and results, both verbally and in writing that (1) demonstrate consistent logic; (2) are well organized; (3) state and defend a thesis; and (4) demonstrate competent use of language.

NMHU Traits Specifically Linked to Student Learning Outcome 3

- Effective Communication Skills

First Means of Assessment for Outcome 3:

Score of $\geq 70\%$ on final project report in GEOL 4/535: ST Geoscience Project describing an original field and/or laboratory study.

Summary of Data

Number of Students Meeting Criterion:	5	Number of Students Not Meeting Criterion:	0
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Total Number of Students Assessed:	5	Percent of Students Meeting Criterion:	100%
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Second Means of Assessment for Outcome 3:

Score of $\geq 70\%$ on final oral presentation in GEOL 4/535: ST Geoscience Project describing an original field and/or laboratory study.

Summary of Data

Number of Students Meeting Criterion:	5	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	5	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 3:

Environmental Geology majors do well with communicating scientific ideas, information, and results. Again, this comes with much faculty-student engagement, from providing writing mini-workshops, power point presentation workshops, and regular feedback on term papers.

Student Learning Outcome 4:

Competently use appropriate tools from geology, chemistry, physics, and mathematics to solve discipline specific problems.

NMHU Traits Specifically Linked to Student Learning Outcome 4

- Mastery of Content Knowledge and Skills
- Critical and Reflective Thinking Skills
- Effective Use of Technology

First Means of Assessment for Outcome 4:

Successful completion of an original field and/or laboratory study in GEOL 4/535: ST Geoscience Project.

Summary of Data

Number of Students Meeting	5	Number of Students Not Meeting	0
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Criterion:		Criterion:	
Total Number of Students Assessed:	5	Percent of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 4:

Score of $\geq 70\%$ in course grade from GEOL 432: Environmental Geochemistry.

Summary of Data

Number of Students Meeting Criterion:		Number of Students Not Meeting Criterion:	
Total Number of Students Assessed:		Percent of Students Meeting Criterion:	

GEOL 432 was not taught during 2014-15.

Third Means of Assessment for Outcome 4:

Score of $\geq 70\%$ in course grade from GEOL 424: Environmental Geophysics.

Summary of Data

Number of Students Meeting Criterion:		Number of Students Not Meeting Criterion:	
Total Number of Students Assessed:		Percent of Students Meeting Criterion:	%

GEOL 424 was not taught during 2014-15.

Interpretation of Results for Outcome 4:

Environmental Geology majors do well using and applying various tool and techniques (for example, field structural measurements, powder x-ray diffraction analysis, rock magnetic characterization, GIS analysis) to conduct applied independent research. The Environmental Geology Program will continue to foster student research through Independent Study, Independent Research, or in group courses like GEOL 4/535.

Student Learning Outcome 5:

Competently use appropriate laboratory and field methods and instrumentation.

NMHU Traits Specifically Linked to Student Learning Outcome 5

- Mastery of Content Knowledge and Skills
- Critical and Reflective Thinking Skills

First Means of Assessment for Outcome 5:

Score of $\geq 70\%$ in course grade from GEOL 375: Field Geology demonstrating proficiency in using a Brunton compass, Jacob staff, and hand-held GPS unit field data collection, as well as abilities in stereographic projections, geologic mapping, cross-section construction, and report writing.

Summary of Data

Number of Students Meeting Criterion:	1	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	1	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 5:

Though only one student attended geology field school in 2014-15, his success demonstrated his experience and proficiency in geology field tools and techniques. The Environmental Geology Program will continue to implement numerous field experiences, from afternoon outings to extended immersive learning experiences, within the curricula.

Student Learning Outcome 6:

Attain employment in geology, environmental science, or related fields and/or continue graduate studies.

NMHU Traits Specifically Linked to Student Learning Outcome 6

- Mastery of Content Knowledge and Skills
- Critical and Reflective Thinking Skills

First Means of Assessment for Outcome 6:

All graduates of Environmental Geology Program find placement in geology-related field

or graduate school within 3 months of graduation.

Summary of Data

Number of Students Meeting Criterion:	3	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	3	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 6:

The Environmental Geology Program boasts 100% placement in career paths or graduate programs of geology undergraduate students. In 2014-15, 3 students graduated from the program and went on to work in geology-related fields (US Forest Service, Geophysics Research Laboratory) or continued on to graduate school (NMHU Natural Sciences M.S. candidate).