

COVER SHEET
OUTCOMES ASSESSMENT REPORT
2008-2009

Natural Sciences

Environmental Geology

Bachelors of Science

Department

Program (major or minor)

(Degree)

Jennifer Lindline

Assessment Coordinator (Print)

Signature

Date

Ken Bentson

Program Chair (Print)

Signature

Date

I. NEW MEXICO HIGHLANDS UNIVERSITY MISSION

NMHU is a diverse comprehensive university serving the global community by integrating education, research, public service, and economic development, while celebrating our distinctive New Mexico cultures and traditions. We achieve this through a University-wide commitment to quality student-centered education.

II. ENVIRONMENTAL GEOLOGY PROGRAM GOALS

Mission

The mission of the Environmental Geology Concentration Program at NMHU is to provide students with the specific skills needed to excel in a discrete field of study by:

- Providing a broad-based undergraduate education in the Liberal Arts and Sciences;
- Promoting study and quality research in the geological sciences; and
- Providing a superior learning experience for students through dedicated teaching, hands-on learning, research, and commitment to the individual student.

Goals

Environmental Geology students will develop an understanding of the physical function, operation, hazards, and connectivity of Earth Systems. They will acquire the scientific knowledge, research aptitude, technical ability, communication skills (both written and verbal), and global competence necessary for a professional career in the field of Environmental Geology at a nationally competitive level.

III. 2008-2009 GEOLOGY COURSE OFFERINGS

Fall 2008

GEOL 101	Survey of Earth Science	78 students
GEOL 317	Depositional Environments	7 students
GEOL 325	Earth Materials	9 students
GEOL 495	Senior Geology Applications	2 students
FOR 4/512	Surveying and GIS	7 students

Spring 2009

GEOL 101	Survey of Earth Science	51 students
GEOL 202/GEOL 290	Earth History	6 students
GEOL 301	Environmental Geology	11 students
GEOL 4/521	Environmental Ground Water Hydrology	5 students
GEOL 495	Senior Geology Applications	2 students

III. STUDENT LEARNING OUTCOMES	IV. OUTCOMES ASSESSMENT
<ul style="list-style-type: none"> Classify and identify geologic materials, including soils, minerals, and rocks. 	<ul style="list-style-type: none"> 59/78 students in Fall 08 GEOL 101 (76%) class and 36/51 students in Spring 09 GEOL 101 (71%) class earned $\geq 70\%$ on lab midterm emphasizing hand specimen description and identification. 5/5 students in GEOL 202 earned $\geq 80\%$ on their lab midterm as well as their lab final both of which emphasized mineral, rock, and fossil identification and interpretation. 7/7 Students in GEOL 317 completed exercises in constructing numerous stratigraphic columns, identifying sedimentary rocks in hand samples, evaluating rocks in thin section, assessing rock textures, and identifying fossils. They also completed a research paper on a northern New Mexico geologic formation and presented the results to the class
<ul style="list-style-type: none"> Read and critically evaluate relevant professional literature. 	<ul style="list-style-type: none"> 5/9 students in GEOL 325 earned $\geq 70\%$ on their required term paper covering a New Mexico mineral resource. Of these same students, 8/9 earned $\geq 95\%$ on their oral presentation.
<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 4/5 GEOL 202 students earned $\geq 80\%$ on their term "rock project" paper and class presentation. 3 graduating seniors were enrolled in GEOL 495 and earned high marks on their final project report. Note: 1 student enrolled in the course in Fall 08 but did not meet the course requirements; he earned an "F" that term. That student repeated the course in Spring 09 and earned an "A."
<ul style="list-style-type: none"> Think critically. 	<ul style="list-style-type: none"> All geology courses have some critical thinking component, as students are expected to integrate field, laboratory, and map data towards a geologic interpretation. This is particularly evident in the upper-division courses. One example is the GEOL 301 final laboratory exercise in land use wherein students have to integrate multivariate datasets to determine best land use for a region in Texas. 9/11 students completed the lab with a grade $\geq 80\%$. Another example is the GEOL 4/521 course. Students are regularly given complicated problemsets for analyzing and interpreting groundwater flow data that require use of calculus and hydrologic modeling software. All 5 students passed the course with a grade of $\geq C$.
<ul style="list-style-type: none"> Competently use appropriate tools from geology, chemistry, physics, and mathematics to solve discipline-specific problems. 	<ul style="list-style-type: none"> 3 graduating seniors earned A's on their senior capstone course. Each used a variety of field and laboratory techniques to collect and analyze mineral

	and rock data and prepare a professional report.
<ul style="list-style-type: none"> Competently use appropriate laboratory and field methods and instrumentation. 	<ul style="list-style-type: none"> 2 senior students completed the GEOL 375 Field Course (offered at UNM) and demonstrated proficiency in using a Brunton compass, Jacob staff, and hand-held GPS unit for field data collection. Both students showed high abilities in stereographic projections, geologic mapping, cross-section construction, and report writing and earned A or B for their final grade.
<ul style="list-style-type: none"> Attain employment in geology, environmental science, or related fields and/or continue graduate studies. 	<ul style="list-style-type: none"> Of the 3 Environmental Geology graduates, 1 is employed with the U.S. Forest Service, 1 is employed in the private sector, and 1 applied to and was accepted to graduate school at New Mexico Tech.

V. REMARKS

Geology faculty has identified weak scientific paper writing, class absenteeism, and inattention to deadlines as on-going problems for some of the Environmental Geology majors. We are addressing this through the following measures:

1. Improving scientific paper writing. Instructors are requiring shorter but more frequent paper submissions. This will provide students with repeated opportunities in developing paper theses, gathering literature resources, synthesizing geologic information, and communicating their findings in writing. Faculty are also structuring timetables for paper milestones (topic approval, preliminary references, outline, etc.) and requiring submission of two to three drafts of the required term papers in order to keep students on a track for success.

2. Improving class attendance. Instructors are developing rigorous and uniform attendance policies.

Attendance Policy: According to NMHU Policy, there are no un-excused absences during any academic semester. However, it is understood that during times of illness, it may be necessary to miss a class. If you are sick and must miss class, please e-mail or call your instructor immediately to communicate your situation and receive the missed material. If you have a personal situation that prevents you from attending class (such as a university-sanctioned event, religious practice, or personal emergency), you provide written verification of your situation in addition to emailing or calling your instructor for the missed work. If you miss more than three classes or labs (collectively) your course grade will drop one full letter grade. If you miss five classes/labs (collectively), you will fail the course. If you miss a test without prior arrangements, you will be given an oral make-up examination.

3. Improving student attention to deadlines. Instructors are developing rigorous and uniform deadline policies.

Written Assignments: A number of written works will be assigned throughout the term. These assignments are due at the **beginning** of class on the date indicated. Part of professional life is meeting deadlines. **Late assignments will be penalized.** 10% of points will be deducted for assignments that are 24 hours late; 20% of points will be deducted for assignments that are 48 hours late, and 5% per day after that. You may resubmit a homework assignment for additional credit, though the maximum score attainable on resubmitted work is 85% of the assignment's original value.

- All material submitted for a grade must be typed (or word-processed).
- All material submitted for a grade should show a high degree of organization, clarity of thought, solid background knowledge, and scientific literacy.
- Grammar, spelling, and style will be evaluated and counted towards your grade for all assignments.
- Direct quotes, ideas, or thoughts of another must be cited properly. Representation of another's work as your own is plagiarism and will not be accepted.

VI. STUDENT ABSTRACTS (*denotes undergraduate student author; ** denotes graduate student author)

Delcamp, A. , V.R. Troll, J.C. Carracedo, M. Petronis, B. van Wyk de Vries, R. Trevizo**, S. Wiesmaier, 2008, *New paleomagnetic constraints on the evolution of the NE Rift-zone and associated landslides, Tenerife, Spain*, Eos Trans. AGU, 89(53), Fall Meeting Supplement, Abstract GP13-03.

Petronis, M.S., B. O'Driscoll, C.T.E Stevenson, J.W. Lowry*, R.J. Reavy, J. W., Geissman, 2008, *Anisotropy of Magnetic Susceptibility and Petrography of the Ross of Mull Granite, NW Scotland: Implications for Ascent and Emplacement of a Reversely-Zoned Intrusion*, 89(53), Fall Meeting Supplement, Abstract GP21D-0794.

VII. STUDENT GRANT AWARDS

- **New Mexico Geological Society Grants-in-Aid of Research**
 –Rachell Pitrucha (**Lindline–Faculty Sponsor**), *A Petrologic Study of the Proterozoic Hermit's Peak Batholith, North-Central New Mexico* (\$1200) Spring 2009
- **NMHU Sigma Xi Chapter Student Research Awards**
 –Rachell Pitrucha (**Lindline–Faculty Sponsor**), *A Petrologic Study of the Proterozoic Hermit's Peak Batholith, North-Central New Mexico* (\$1200) Summer 2009